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Psychological Review

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PRINCETON UNIVERSITY

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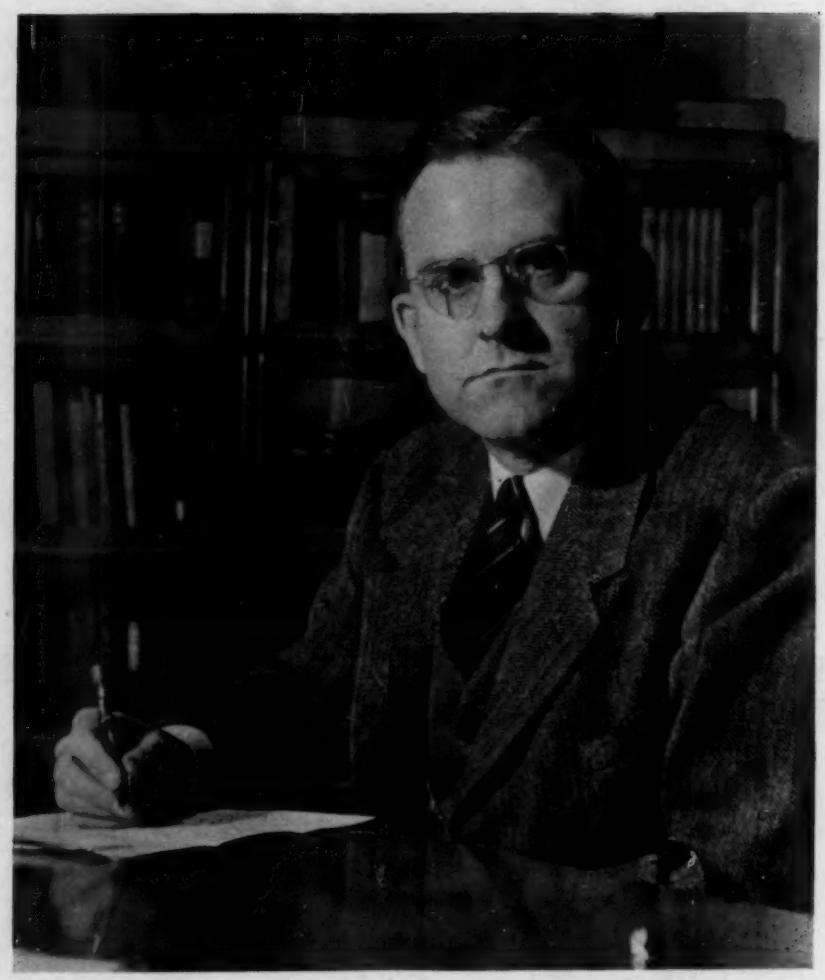

John A. McGrath

VOL. 49, NO. 4 JULY, 1942

THE PSYCHOLOGICAL REVIEW

JOHN ALEXANDER McGEOCH

The contributions of John Alexander McGeoch were numerous and of excellent quality despite the relatively short period of his professional life. In a little over two decades following his first publication he influenced the theory and structure of psychology through his teaching and research, and won the personal regard of his fellow psychologists to an extraordinary degree. His professional work in teaching and administration was done in succession at five different universities—Washington University, University of Arkansas, University of Missouri, Wesleyan University, and the State University of Iowa. Research contributions were issued from each laboratory. The frequent moves seem scarcely to have affected the steady flow of his communications to psychology through its journals. A complete bibliography of his writings exclusive of book reviews, notes, abstracts of papers read at meetings, etc., contains more than fifty titles. Approximately three-fourths of his major publications in the journals represent reports of experimental studies; the others are distributed in the main between systematic reviews of research work in special fields in learning and memory, and contributions to psychological theory.

McGeoch's early studies in psychology, many of which were completed and published while he was still pursuing his graduate studies at Chicago, indicate a diversity of research interests. Studies were made of such questions as the relationship between suggestibility and intelligence in delinquents, the perception of filled and empty time, the performance of vocational men and students on three types of psychological tests, the fidelity of report of normal and sub-

normal children, the reliability and use of the Pressey X-O tests for investigating the emotions. At this time, however, his main research interests concerned problems of learning and memory, and it was in these fields that his research efforts became concentrated.

The concept of learning was for McGeoch one of the most fundamental in psychology. Even at the time of his initial research in this field he seemed to have little sympathy with the view that regarded learning as belonging more to educational than to general experimental and systematic psychology. Later, in one of his best theoretical papers, he called attention to the manner in which learning pervades the major categories of psychology and deplored the practice in current textbooks of treating learning as if it were a special and compartmented set of events having little relation to such processes as perception, affection, reasoning, motivation and volition. The failure generally to recognize the systematically fundamental character of the concept in psychological theory and experimentation was partly the result of preoccupation with the cross-sectional type of analysis. The special problems of the categories which had ordinarily been studied in cross-section are really continuous with those of learning. "Perception, ideation and the rest, as horizontally studied, are moments in the flow of learning. The specificity of each is a function of prior learning and the occurrence of each is a condition of present and of later learning. Each is a brief cross-section in a flow of events determined by the endogenous conditions of the maturation-degeneration continuum and by learning-forgetting. Each rests upon its own past history and points forward as a potential determiner of future history." The variable of learning provides, then, "a major dimension in any longitudinal systematic organization of psychological fact."

The position that the starting point for theory should be sound experimental fact and that the excursion in theory should lead back to the laboratory, was not merely a point of view for McGeoch but is the fundamental principle on which all his critical writings are based. He was especially inter-

ested in attempts to systematize the body of knowledge in psychology and in 1933 presented what he considered to be the basic common problems of systems of psychology as viewed from within the subject-matter of the field. It was believed that some agreement among the contemporary systems might be facilitated by a statement of the formal criteria of systematic psychology. His interest in this effort, however, was mainly the interest of an experimenter, representing a recognition that experimentation requires, both for its guidance and for the interpretation of its results, a wider relational structure than the laboratory provides. In the development of a systematic theoretical structure the basic concepts should be unequivocally defined, and Bridgman's suggestion of operational definition as a technique of building concepts in physics strongly appealed to McGeoch. He became an exponent of the applicability of operational definition and held that even with certain limitations it was the best procedure for the construction of the concepts of psychology. This procedure did not involve the espousal of a new system or 'school,' but was for him simply an explicit formulation of the procedure which careful experimenters employ.

While McGeoch preferred the investigation of learning and forgetting to other experimental topics it is to be remembered that such studies were regarded as having relevance to topics normally classified under other headings. His attitude toward learning has been noted. He regarded forgetting of fundamental theoretical importance because of its pervasiveness and generality, and believed that a theory which can account adequately for its major characteristics will have implications which ramify into other major problems. Some of his contributions to the experimental literature on learning and forgetting will be singled out for special mention.

Prior to McGeoch's work separate studies on the retention of acts of skill and memory materials, reporting high values in the former and rather low ones in the latter, had given rise to the generalization that verbal habits are less well retained than non-verbal habits. This generalization was widely held despite the fact that it was difficult to find direct comparisons

of the two kinds of material under comparable conditions. Such a direct experimental attack on the question was made by McGeoch and Melton in 1929. The data offered no support to the view that motor (non-verbal) habits persist longer than verbal ones. The experiment indicated strongly that the two habits will be equally well retained if other conditions, such as degree of learning, interpolated activities, etc., do not favor one habit to the detriment of the other. This latter generalization was corroborated in another experiment by McGeoch in 1932.

In a long series of investigations of the efficiency of memory under different conditions of interpolated activities, McGeoch contributed much to our present factual knowledge of the important determining variables of retroactive inhibition. He was one of the most active workers in this field and from his laboratory came much of the available experimental material concerning each of the primary conditioning factors, such as the similarity factor, degree of learning, temporal position of interpolation, etc. He demonstrated the inverse relationship between the amount of retroactive inhibition and the degree of learning of the original problem, thereby confirming experimentally the earlier observations of Heine in Müller's laboratory. Later studies showed that the amount of retroaction is also a function of the degree of learning of the interpolated problem. The importance of the similarity factor in retroaction was shown in several studies and its relation to the perseveration and a transfer theory carefully evaluated. The most extensive data available on the temporal course of the inhibitory effects of interpolated learning come from McGeoch's studies on this question. These studies indicate that there is very probably no uniform and consistent variation with time in the percentage of retroaction.

The results of laboratory studies on forgetting were marshalled and used in a critical evaluation of the law of disuse. The experimental work on retroaction demonstrates, McGeoch held, that forgetting varies with interpolated conditions rather than with disuse, and that disuse is relatively unimportant and probably entirely ineffective. The positive hypothesis

was advanced by him that the necessary conditions of forgetting are two: interpolated activities, and altered stimulating conditions. Other factors of which forgetting is a function have the status of subconditions.

A textbook of the psychology of human learning was completed and sent to the publisher shortly before his death. Its publication has been announced for August. Another book of wider scope, begun earlier and intended as a critical and systematic treatment of the experimental and theoretical contributions to the field of learning and memory, remains unfinished. This work was being done in collaboration with his former teacher—the one who undoubtedly influenced him the most—Harvey A. Carr.

Under McGeoch's editorship the Psychological Bulletin established an excellent record of critical and timely reviews of the literature on special problems currently studied in experimental laboratories.

At the time of his death McGeoch was professor of psychology and head of the Department of Psychology at the State University of Iowa. He was completing his first term as Editor of the Psychological Bulletin and had been reelected for a six-year term. He was also President of the National Institute of Psychology and Temporary Secretary of Section I of the A. A. A. S. In his passing, experimental psychology loses one of its leaders in the finest sense of the term.

M. E. Bunch

Washington University

PSYCHOLOGY AND THE POST-WAR WORLD[1]

BY GARDNER MURPHY

The College of the City of New York

I. Introduction

In the year that has elapsed since Walter Hunter addressed this Association, much has happened to give added weight to his comments on the professional training of psychologists. Much of what I feel impelled to say is, in a sense, a continuation of the discussion of his problem, in the light of the fact that today we confront not the threat of war but war itself, and after it, a world-wide jungle of post-war problems.

Psychologists are serving today in many different capacities in the armed forces. The special skills of others are being used by the Office of Facts and Figures, the Federal Communications Commission, the Coordinator of Information, the Departments of Labor, Agriculture, Justice and the Interior, and by many other government agencies. Some are serving as personnel specialists in industry and as students of industrial efficiency. Within the last few weeks, there have come from Washington many additional types of demands, and a hasty search is being made to find qualified persons for the new tasks. The problem is not to 'sell' psychology to Washington, but to supply Washington promptly and efficiently with what it wants. Psychology is in urgent demand in a hundred specialized services.

But this demand is only beginning; it will become more and more insistent. With the coming of peace it will become not less, but greater; psychology is going to be on the spot, challenged to give the nation something essential to its life. We have not been well prepared for war, but we are in danger of being even less adequately prepared for peace. Will psy-

[1] Presidential address read at the 13th annual meeting of the Eastern Psychological Association, April 17, 1942.

chology be ready to contribute when the post-war world demands that it play its potentially tremendous role in stabilizing the peace and making it a genuine peace upon which civilization can be rebuilt?

Far indeed from believing that reflection on the future will diminish the effectiveness of what we do today, I believe that the clarification of vision regarding the post-war world is one of the main factors which can intensify and coordinate our present effort; it may serve to make clear to what end the struggle tends and to define its meaning in long-range terms. Moreover, the struggle for world democracy and a practical, human organization of world society is one sustained struggle, continuing without let-up by the means of both war and peace from this day forth for years or decades ahead; in short, the problems of winning the war and of winning the peace are in many ways intimately, organically fused. To think of the post-war world is one step in winning both war and peace.

The world's agonized convulsion today will do much to recast all the sciences that deal with human nature. The armed forces, the production program, and the functions of government are making new demands upon us to strain ourselves to the utmost in attacking new problems, looking at things in new ways, conceiving new methods. Moreover, the post-war generation, grown harder and wiser than its forebears, will demand and will have to be given a kind of psychology differing in scope, depth, realism from anything we have been able to give in the past. In short, psychology is going to be struck by new forces with such violence that it may be worth while for us to think about the direction in which such forces will impel our science.

Three aspects of this impending transformation may be defined. First, I shall try to show that social demands are controlling forces in psychological history, that our discipline has grown not only through the inner necessity of its own intrinsic aims but also through the powerful pressures exerted by the cultural, especially the academic standardization of its role; and that consequently we may reasonably conclude that in the immediate future, also, social necessity will do much to

mark our course. Second, I shall try to show the specific respects in which research in psychology and its applications is being recast, and the accelerated pace of such changes. Third, I shall try to show that the emerging psychology, bearing an organic relation to the post-war world, has an opportunity to play an important part in humanizing and stabilizing the world order, that without it the military and economic sanctions of a peace treaty will probably fail, and that therefore, important as psychology may be today, its importance in the consolidation of an enduring peace is greater still.

II. Social Pressures

My first task will be the evaluation of psychological history in terms of social pressures and demands. I shall try to show that the rise of modern psychology in Germany, France, Britain, and the United States has followed very closely the course prescribed by the intellectual climates of these four worlds, and shall suggest that the psychology of the post-war world can consequently be very simply predicted by studying the chief demands which that world will make upon psychologists. The developments in Europe and America in the last seventy-five years can be most adequately understood if we take note of the human situation, especially in the academic world, and the human beings exposed to this environment, and ask ourselves what forces pushed them to move toward one, rather than another psychology. *Homo academicus*, like other members of his genus, wants not only a job, a good, an interesting, life, but with an especially pitiful intensity, he wants status, prestige, recognition.

Let us see how his need for prestige drove the young German psychologist of the last century. He could become a past master in the things of the spirit, a *Geisteswissenschafter*, or, if he hesitated at the brink of so vast a flood, yet still lingered, looking for a way to study psychology and still have prestige, he might take note that exact quantitative work in the biological sciences could always bring quick recognition, and in every German university, to achieve such exactness in

treatment of biological data was the passion of teacher and student alike. Now there was one biological field where such exact treatment threw light on the great traditional psychological problems, namely the field of sense-perception. Is it any wonder that sense perception was studied ardently by the new experimental psychology? This was good, for it was exact science. The instant that comparable mathematical exactness, in Ebbinghaus' hands, brought comparable prestige to studies of memory, dozens of new workers joined the new trend. The usual interpretation of these historical steps is, I believe, upside down. It is usually said that a group of young workers impetuously forced open the door to one new room after another. The fact is, I fear, that clusters of earnest young workers waited nervously, milling about in the halls, to see which door would be burst open and prove to be a safe abode for a true scientist; thereupon, knowing that all was respectable within, they filed in and began to add their reports to the pile. All of which was a pity, because it meant that the need for prestige largely determined the flow of research, and that a great many vital things, such as the study of motives and values, and of the prestige motive itself, were neglected for the simple reason that there was scant prestige in studying them.

If one looks at French psychology, the same thing is there. A lucid French association psychology, mingled with that experimental biology which France had done so much to cultivate, had yielded by 1900 an exquisitely clear and coherent bio-mechanics of personality, admirably suited for presentation to the elegant audiences of the Collège de France, and altogether too mature, too prematurely middle-aged, to have any place for studies less exquisite, or more extensive, than those of Pierre Janet. In France prestige meant subtlety, finesse, urbanity. No others need apply.

British culture, in turn, and the British university system, readily explain most of what happened in British psychology. Bain and Spencer, Darwin and Galton, were non-academic psychologists with the free-roaming mentality of an intellectual leisure class, fine powers of observation, and a capacity

to think out loud. They did their work, lived and died, before any academic department of psychology could kidnap, crystallize, or canonize them. But fate exacts heavy payment for such absent-minded largesse. The British universities were too completely consecrated to classical, respectable, laurel-crowned traditional dignity to take any note of the new experimental psychology, with the consequence that if you wanted prestige, the correct opinion to hold at Oxford and Cambridge was that all this German stuff is a beastly bore and, thank you, we'll stick to Aristotle. The evolutionary theory, which had, of course, enormous prestige, was well grafted on to traditional philosophical systems. British psychology later developed some tests, but tests as such had no prestige; it was when the intricacies of their factorial analysis dawned on the imagination that their opportunities for unlimited prestige were grasped. The land of Newton could well take pride in the reduction of psychological events to measurable, preferably heritable entities.

Now every one of these developments may have been all for the best. I am making no normative judgment, no judgment of value. I am trying to find the reasons for the course which psychology took in each of these three lands. And I cannot help thinking the reasons are very simple: *homo academicus* has needed to be safe, has needed to do the things that the familiar protecting intellectual world approved.

The genesis of American psychology illustrates all this even more piquantly. The new laboratories of the 'eighties and 'nineties received prestige in a practical land where philosophy was gradually losing its academic grip and experimental science was gaining. Psychologists succeeded in detaching themselves from the maternal grasp of philosophy, ran off to play with experimental physics, chemistry, and biology insofar as these golden haired children would allow the upstart to enter their games. Now since training in perimetry, flicker, and determination of cutaneous two-point thresholds did not fully qualify the young Ph.D. to give instruction in all the things that students of psychology wanted to know about, each generation had to be shown which problems, which

investigations were scientific, that is to say, for which ones there were ready-forged and approved skeleton keys. As time went on, the fields of thought, motivation, personality study, became more or less accredited in their way, though every one knows what a struggle it has been to make these inquiries reputable, and that precision is still the chief ticket of admission to scientific respectability. Since physics had supreme prestige, and was very precise, there was a very natural tendency to assume that psychology must in all ways emulate physics. Again, I am not decrying the event. I am struggling to understand it as the response to a prestige-ridden world, and to suggest that what you and I as psychologists do is often determined less by the intrinsic appeal of a problem than by the likelihood that the canons of scientific respectability at the moment will protect it. Well, if prestige is as important as all this, why do we find in the textbooks that hunger, sex, fear, and rage are the important motives, while prestige is a secondary, less compelling affair? Because to pay attention to prestige is in itself evidence that a psychologist is off center. Hunger is exact, you can measure it; rats have it, babies have it. The need for prestige? Let us wait till we can get it on the electric counters. Then it will be scientifically important!

Now if I believe all this, what right have I to think that the chance for a more daring psychology, rooted a little deeper in the stuff of the human life process, will ever exist? That right comes, I think, first from the fact that prestige standards can rapidly change, and are manifestly changing today, so that many things improper to study today you will be expected to study tomorrow. Secondly, from the fact that other human wants as imperious as prestige will drive toward the remaking of a shattered and bewildered world. If it can be shown with reasonable clarity that the world will have little prestige to give for doing what we have done in the past, but will desperately need certain things from us as psychologists, and that the existing professional groups can render service, and gain corresponding prestige and power, only insofar as we do the things that the world needs, I think you will agree

that these changes in psychology will occur. There are the stimulating forces, here are we, the sensitized organisms, for which no other sort of response will be possible.

Indeed, during the present century academic prestige has had to compete more and more intensely with several other forms of social pressure, which have had their enormous role in the remaking of psychology. At about the turn of the century a series of new forces, over and above the academic ones, began to push upon psychology, move it in new directions. Problem children pushed open the doors of laboratories and turned some of them into clinics. The Minister of Public Instruction set Binet to work on his standardization of intelligence tests; and the educational world kept pushing till intelligence tests were a by-word in every school. Industry pushed for systematic study of workers, their capacities and their ways of working; business pushed for studies of advertising and selling; in time came a demand for more systematic studies of marketing, and the press and the Federal Government came calling for more complete and exact information about opinions and attitudes. Psychologists moved to meet a social situation, adapted themselves to a world which had use for them insofar as they possessed the needed elasticity and imagination. Psychology has evolved not as a child puts one block upon another, but as his personality stretches, reconstitutes itself, in response to his need to find his place in the world.

III. Interdisciplinary Trends

The chief pressure being brought to bear *today* upon psychology may be easily recognized as a pressure for *interdisciplinary research*. The great problems today are mostly interdisciplinary problems; they are problems which can only be attacked by those equally at home in several fields of research. It is assumed that any contributor to the theory of consonance and dissonance will make himself competent in physics, anatomy, physiology, psychology, and in the theory, history, and practice of music. The Inter-Society Color Council calls upon the labor of physicists, chemists, physi-

ologists, psychologists, artists, engineers, manufacturers, motion picture producers. The problem of aging calls today for the contribution of physicians, physiologists, nutritionists, psychologists, educators, economists, sociologists. The psychologist studying tone or color does not imitate physics; he uses it. The psychologist studying old age does not imitate physiology; he uses it. Examples are multiplying today at such a pace that we can no longer characterize the interdisciplinary trend as a 'current'; it is becoming a tidal wave.

More and more our professional organizations, established along the lines of college departments, have been supplemented by inter-departmental bodies dealing with common problems. Thus, all the people concerned with early childhood, whether they be psychologists, educators, pediatricians, nutritionists, social workers, may convene to discuss the problem of the influence of defense migration upon the emotional stability of the young child. Or the people interested in industrial personnel problems, meeting to discuss the selection of workers in war industries, may include managers, engineers, economists, physicians, psychologists. After such meetings, one is not only stimulated; one's mind is stretched. One finds oneself less a specialist in a formal discipline, more a specialist in a phase of human experience. This trend is not a trend away from specialization, upon which so much has been written. There can be no reduction in the quantity or the technical severity of training. On the contrary, the present movement involves pressure towards a new, perhaps higher order of specialization. To be expert on the young child as such does not mean less specializing than to become a psychologist. It means being a psychologist and a great deal more, all fused at high temperature in the capacity to see the child as a child, as bones, nervous system, respiratory rate, fear, intelligence, perception patterns, member of a family, race, community, nation, all at once and in interrelation, to see the child as something other than the necessary abstractions which earlier disciplines have substituted for him. The industrial worker is another such unit, and to understand him

is at least as complex a specialty as psychology, or medicine, or management, or engineering.

But what I am offering is not a plea, it is not an appeal. History has moved on. We are confronted not with a plea, but with a fact. Whether we like or dislike it is of small moment. Our task as psychologists, rather, is to recognize a social situation of the utmost urgency for our own science. The need to grapple with insistent problems for which no single academic specialty suffices is a major force in the making of the psychology of tomorrow.

This will be a tomorrow in which, for the first time in history, there can be a psychology of such stature as to make a vital difference in the direction in which civilization moves. When the soldiers come home they will present us with a thousand overwhelming interdisciplinary problems of reallocation, readjustment, reorientation, for whose solution the biological and the social sciences will have to be mobilized swiftly and surely. When our post-war American public struggles to redefine its civilization, its place in the world, and all the biological and social sciences are desperately needed in clarifying the task, psychology can be enormously useful. But it will not be a psychology jealously guarding its rights; it will be a psychology which is an organic aspect of a unified program of interdisciplinary research and practice.

What, then, do we mean by interdisciplinary trends? When some of the new physical sciences, such as geology, came into existence in the last century, they were not mere summations of physics and chemistry, but new sciences. In the same way, new sciences are coming into being today which are not simply psychology plus something else. The new sciences are built by those who are masters of the old, and, by temperament and training, capable of achieving vantage-points which give a vision of the new. By interdisciplinary problems one does *not* mean problems generated by the fortuitous juxtaposition of two techniques from different fields. Most such hybrids, generated, we might say, by the method of random rather than assortative mating, produce sterile offspring. The most lively offspring are those from lively and

well-mated parents. Thus, today the problem of the nature of conflict within the organism is being so stated as to permit the psychoanalytic procedures to articulate with anthropology on the one hand and with the experimental study of children and animals on the other. Similarly, problems involving the use of field theory, as developed in physics, have appeared in the biological sciences, for example in the work of Spemann and Weiss in experimental embryology and in the work of Kurt Lewin in experimental psychology. You will think of a dozen comparable instances of problems that cannot be approached without the integration of methods and viewpoints from several fields.

But to recognize the fact today is of scant value in itself; the urgent thing is to train a generation of students capable of such integration. Now, as Walter Hunter made abundantly clear last year, this is no simple question of loading the undergraduate or graduate student with more and more courses in physics, physiology, embryology. This training serves an important purpose if the student constantly uses these specialties and ingrains them more and more deeply into himself. Even to take such courses without using them leaves, I suppose, some slight residue in the sense of the residue that Ebbinghaus could still measure after twenty-two years of quite decently and thoroughly forgetting Byron's *Don Juan*. My contemporaries and I swallowed chunks of neuro-anatomy, physiology, genetics, some detectable trace of which I daresay may have gotten into the blood stream. What I mean, however, has very little to do with taking courses, reading books, or listening to lectures. It is a thing learned by doing, it is a way of thinking and acting that comes only after prolonged confronting of a task which will not succumb to a traditional analysis, even of the highest order. One learns interdisciplinary science only by prolonged grimy digging through those problems which imperatively demand the application of many approaches. One learns in the sweat of such integration. One sees interrelations by taking a problem apart and seeing what makes it tick, a practicum of

the sort a physician gets in his last years of medical school and his internship.

And as in medicine, there are personal qualities which partially determine the capacity for profiting by such training. As Harry Helson puts it, "the successful worker in interdisciplinary problems is likely to be the one who has the personality to get, gather, organize, and apply everything that is relevant to the problem that faces him." [2] In view of the present speeding up of educational processes, it is timely to be looking for those students who give promise of achieving interdisciplinary competence; and for those who have started their training, it is timely to provide in our laboratories, and in our field work, a diversification of experience, and to see to it that the younger men and women in the field are given the chance to participate in the many interdisciplinary activities so essential to their usefulness in the future. There will indeed remain a place for continued investigations and applications along classical lines. The great opportunities which open to present-day psychology are, however, as in the chemistry of Pasteur and Madame Curie, opportunities opening to those for whom the classical outlines are a chrysalis from which to emerge.

By *emerging*, I mean literally cutting out of the compact and comfortable packet of academic specialization into which one has been so snugly rolled. Illustrations can be found in physiological, abnormal, or any other branch of psychology, but I will illustrate by referring to rigid versus spacious thinking in social psychology. I should like to tell what I learned from a friend of mine. This friend, having come into psychological work by the back door, sees problems in social psychology in a form more substantial, having more *Prägnanz* than the form in which I, as a psychologist, had been trained to see them.

He mentioned one day a series of cases in which a powerful man, working alone, had found no way to crack the vast hard block of vested interest that moved forward to crush and pulverize him, there being no place in this world of increasingly

[2] Personal communication.

vast forces for the lone wolf, the solitary crusader. Lesser men, sitting high on the head of an industrial elephant, had guided it forward, commanding forces which greater men would have died to wield for an hour. I demurred at the impersonality of this approach. I held that the very impersonality of the industrial order, the very vastness of the modern political state gave the favored individual a power far greater than he ever could have possessed in days of a simpler social organization. "Yes," he said, "the individual has such power, but he who grasps it is he who has allied himself with it; he who gets control of the new leviathan may guide it by becoming one with it. He cannot, as a David, oppose its Goliath-like strength, bring it down with a single well-directed blow."

Now this, if you like, is a historical or a sociological question upon which I should not be ashamed to find myself stammering for a reply. Let us suppose, however, for the sake of the argument, that Bob was right, for it is Bob Lynd of the Middletown study whom I am quoting. If he is right, I should at least have been able to answer the following psychological question which immediately arises: "What is the nature of that personality which can take hold of and guide one of these vast leviathans? What is the character of modern leadership in contra-distinction to all leaderships of an earlier day? How is the modern leader selected? What is the mesh through which his personality must pass?" As a psychologist I should have had an hypothesis. Or suppose that Bob was wrong. Suppose that the very character of the leviathan or its direction depends upon special creative powers, in the sense in which Lenin gave to Marxism in Russia a peculiar quality upon which the success of Marxism at the time surely depended. On this basis the situation for me in the debate remains as bad, for I ought to have had an hypothesis about the character of the leaders who can in this way guide the leviathan.

Bob Lynd thus presented first magnitude problems which are none the less psychological because at the same time they require data from other fields. Some will say, in extenuation

of my unpreparedness, that these are problems for the historian or sociologist. The fact is that they are problems for any one big enough to cope with them. It is our responsibility to see that a few, at least, of those trained in psychology become big enough to cope with them. If we object that study of individual men is a biological inquiry, that its methods do not apply to the social sciences, I can only say that while one studies the individual, another the properties of groups, most of the major issues go down the drain pipe. A dozen years ago Boring showed how, in scientific controversy, the debaters on both sides have regularly been wrong.[3] A third party has seen the truth lying untouched between them and has absconded with it. So, I think, a few individuals with genuine vision will abscond with the post-war problems for which a solution is imperatively demanded. For, if we stand by, trying to get everything in readiness to study problems of major import, then by the time we look out of the window, there will be a different world to which we have given little. By marshalling, now, what we have, modifying it in the light of mistakes, adapting to the character of changing problems, we may find ourselves doing a less perfect task, but a task of such magnitude that in a new world, there will still be free social sciences, there will still be a free psychology, stretching itself to fill the larger spaces which such a society will expect it to fill.

Post-war psychology will be a psychology with fluid boundaries, with lively articulation with many other scientific fields, its orientation determined chiefly by the character of the post-war world itself, and the leaders drawn from those who, going beyond problems in technique, have learned to recognize and to grapple with first magnitude problems wherever these appear.

Thus far, I have spoken of the interdisciplinary trends in psychological research. I believe that every word applies as well to the *applications* of psychology.

A partial list of positions currently needing to be filled in

[3] E. G. Boring, The psychology of controversy, PSYCHOL. REV., 1929, 36, 97–121.

applied psychology would include personnel technicians, vocational guides; students of food-habits and of drug addiction; of visual and auditory perception in combat situations; radio and press analysts, workers in market research, public opinion polling, and interviewing; industrial fatigue specialists; students of mental hygiene in association with family health; psychologists with the Children's Bureau, with private and public nursery schools, with clinics, hospitals, courts, penal institutions; students of the psychological effects of physical defect and handicap, and of the problems of aging. In every such field of public service and of private clinical practice, more is wanted than proficiency in an academic subject matter. Indeed, more is involved than 'training'; more, even, than experience. There are individual differences in capacity to catch the spirit, the scope of interdisciplinary applications. Attention is more and more being given to those qualities of personality which alone fit one to apply psychology, not only qualities of intellectual suppleness, but of stability, sympathy, warmth, humor, the capacity to adapt quickly to human situations; and when these qualities are wanting, more consideration is being given to the degree to which we can cultivate them.

When the Office of the Coordinator of Information suddenly wanted a man to gather, integrate, digest, interpret, and report upon various types of attitude and opinion prevalent in other lands, it was not just a question of finding a good social psychologist, nor a question of a social psychologist who happened to know a lot of history, economics, sociology, and government. It was, rather, a completely new assignment at a higher level of integration, an assignment that could be successfully filled only by a man with unlimited imagination and really trained to do interdisciplinary work of the type described. In every post of responsibility, excellence as a psychologist is presupposed, knowledge of other fields is necessary, but the prime essential is the capacity to identify oneself with a human situation and marshal everything one has in reducing it to intelligibility.

IV. Typical Problems of the Post-War World

Now, the important question remains; what place will psychology take in defining the character of post-war adjustment, in achieving and maintaining a decent peace, in devising a humane, practical basis for a world order? For these are just the questions that we are being asked to help solve and we shall be asked more and more insistently for our answers. The psychologist, urgently confronted by society with a pressing question, can no longer shyly retreat, innocently gasping, "Who, me?"

I know that many will wonder, "Suppose we train ourselves and our students for such vast undertakings, is that any guarantee that our services will actually be used? Who will want us? What reason have we to believe that government, or industry, or clinical services will actually make use of psychology?" Why, they are actually hammering at the door. Our sound-proofing, our floating floor is so exquisite that we should not hear if somebody banged at the outer door this evening. Demands for such services are mounting, and the chief thing keeping them from mounting still farther seems to be the lack of preparedness of our colleges and universities to make available the specially qualified people that are wanted. We have perhaps sometimes trained more potential teachers than can be used as teachers at the moment, but nowhere near enough social and industrial and clinical psychologists of the first order.

We are at last responding to the demand. As the war goes on, we shall have to respond faster and faster. When the post-war world presents itself, we shall have learned much and be ready to learn more. We shall have to prepare many more social, industrial, clinical psychologists than there are today. The Federal Government is going to need not less, but ever more and more, such specialists to cope with the tremendous problem of a world in which we shall have vast economic and political responsibilities. Not only will Government need a lot of skilled psychologists for a long, long time to come; private industry is going to need to know everything it can

find out about the aptitudes, the flexibility, the morale, the willingness of those who return to it from the army; and with the tremendous federal and private capital that will be poured into industry to get it going again, today estimated in terms of many billions of dollars, the budget for psychological services in helping individual workers to get started again, reëducated, reoriented, and in helping industry to find the right workers, will be a trifle compared to its tremendous potentialities. The Galloway study of post-war planning [4] is simply peppered with psychological opportunities. The only question is whether we have sufficient breadth and imagination, sufficient patience and human understanding, to plan and to complete the project.

And in the study of both war and post-war problems our colleges, as well as our federal departments, are already making an incisive start. As an example, the many university defense seminars which have been organized in response to the appeal of Gordon Allport and his co-workers are enlisting the cooperation of a large number of psychologists and students, and are already gathering a significant volume of data for government agencies concerned with domestic and international trends. These seminars are kept busy; they encounter far more problems than there is the man-power to solve. The resources of government and the enterprise of individual scientists are working toward common goals, and the research done today to help in winning the war will lead directly to the research of tomorrow to help in laying the basis for a decent and lasting peace. It is absolutely safe to say that both in government and in academic institutions, studies of post-war problems are going to make more and more rapid progress, and enlist more and more trained people.

I am not of course predicting the ways in which these post-war research studies will be organized or financed. A pretty large part, I believe, will have to be done by Government; there will certainly be a great deal done by industry and by private market research and opinion polling services. The

[4] G. B. Galloway. *Postwar planning in the United States*, New York: Twentieth Century Fund, 1942.

university and college groups which have learned to work with government on their problems today and are catching the vision of an international social psychology in the study of world trends of thought and attitudes, are hardly likely to turn away from so huge a task upon the signing of an armistice. This does not, however, mean that we should urge students to train themselves in a manner to carry out some *narrow* and *specific* post-war service. The indications lie in exactly the opposite direction, namely that students should prepare themselves in the broadest possible way to understand the human beings of the post-war world, in the assurance that for men and women with understanding there will be a large place.

Now to look beyond the next range of mountains, I believe we are justified in predicting that a stable world order will be founded upon two things, internationalism and science. So remarkable a statement has recently been made on this topic that I must quote it here:

> Any plan which is based upon the notion that some one set of cultural ideas should dominate the world is provincial, and doomed to eventual failure. Such a plan would inevitably fail to provide any positive role for the other great civilizations of the world, and would therefore fail to enlist the members of these other civilizations in world cooperation. No plan which conceives of the Atlantic Basin as the hub of civilization and regards the rest of the world as permanently 'backward,' or as 'colonies,' has the sort of base within which the peoples of Africa and Asia can be integrated.
>
> . . . scientific knowledge and scientific insight will be necessary in the drawing up of any plan for world cooperation. Such a plan must be conceived on lines which transcend the limitations and cultural assumptions of any one people, and the scientific approach to human relations is the only one which seriously attempts such a width of vision.

I have quoted from Gregory Bateson's statement in behalf of the Council on Human Relations.[5]

I should like to put before you a few of the typical problems of the post-war world about which our Government is now

[5] Council on Human Relations. 15 West 77 St., New York City (statement of policy).

thinking, and upon which it wants your perspective, your research suggestions.

Quite aside from the problem of industrial reallocation of men after the war, their return to civil life will present colossal problems. These men will include those who have been seared, hardened, perhaps calloused through long combat service, those who have been war-shocked and unnerved, those who trained a long time, were made ready, and then kept waiting, those to whom the armistice means confusion, disorientation. There will be many who can easily fall back into the familiar round of pre-war civil activities, and those who never, as adults, tasted civil life before; there will be those who find the normal civilian life unreal and have no heart for it, those who are wild to start again but do not know how, those who do know how but lack the education and special skills to do what they know they want to do. But one thing these men will have in common: They will crave understanding of the post-war world, understanding arising from study of human nature, its social conditions, its cherished hopes, its means of defense against its own weaknesses. These men will expect us to understand all this a little better than they. Can we give those who return to college the sorts of things they want? And to that larger number who cannot come to college, but will strike out rather blindly in an effort at renewal of life, can we make ready to do our full share in adult education programs, in vocational, in personnel work, in writing, broadcasting, lending a hand in the vast reëducation task wherever we can?

Second, in view of the tremendous reluctance which Americans have to embroiling themselves in the fate of the world, and the intense satisfaction they may have in undertaking to get back to a normal life again, how is the necessary world-mindedness, the necessary capacity to follow and understand world affairs, to be given to American youth? Our leaders may well find themselves, as in 1920, faced with a public bored with the problem of winning the peace. But unless the public can be reached, the peace is lost. If psychologists can help an advertiser to awaken interest in a new

soap, they can certainly help government in making its appeal for the study of the post-war world, and carry the message week by week, year by year, till the peace is won.

Third, how can the hard, tough, devoted, fanatical young German, reared in a school of blood and iron through all these years of Nazism, accept a world either of international conciliation or of reconstruction of a Germany of music, philosophy, science, and high intellectual leadership?

Fourth, how can the once utterly proud, free-spirited, people of France, now broken, humiliated, demoralized, embittered, accept a strange new world order, dominated by peoples whose civilization they consider inferior to their own, and with no directive, no lode star, to the recovery of the grandeur of their past?

Fifth, how can Italy, mother of Arts, bound down by twenty years of fascism and economic spoliation, poor in resources, broken in heart, move again to regain her glorious position as free interpreter of the things of beauty?

You may feel that it is unprofitable to attempt answer to these latter questions now, because you may feel that the only course open to us is the Anglo-American policing of the world for 50 years. But even if we assume that this outlook is correct, let us follow the consequences. Surely such a policy would imperatively demand those very studies of French, German, and Italian sentiment and attitude to which we referred; it is difficult to see how a mechanical application of military or economic sanctions can begin to cope with social problems of such magnitude and complexity, problems which put us as psychologists to the supreme test. Perhaps we shall find that among these broken and humiliated peoples, basic problems of self-respect, sense of worth, and membership in the human family, freedom from anxiety and inferiority, in short, psychological problems close to the nature of the self, have as much to do with peace as have the considerations of military disarmament.

Some of us knew and loved the Germany and Italy of twenty-five years ago, or the beauty of Hokusai and the tenderness of Kagawa. A progressive brutalization has, of

course, gone on and the military engines have partially obliterated the values that had been slowly reached by these three national states. The fact remains that these national groups will, in some form, still exist even after a very long war. They will need not only to be economically salvaged, but humanly rebuilt. We proved incapable of rebuilding twenty years ago. We apathetically allowed misery and revenge to rebuild Germany as it is today. We watched the rise of fascism in Italy and in Japan with a fascinated sense of helplessness. I am well aware that intellectual isolationism is still a highly reputable doctrine, that international laissez-faire in the guise of non-interference with foreign states will be ardently supported by many. I am none the less convinced that if we wish our children and our children's children to fight ever more destructive wars in a mounting spiral of revenge and counter-revenge, we have but to retreat into our scientific shells and await the process.

Some will tell us that this is a task not of science, but of government. This view, I think, shows a misconception as to the rapid changes occurring both in government, in science, and in the interrelations of the two. Actually, government relies daily more and more upon science, is more and more eager to use not only the technical resources but the vision of scientific men. It is we, the students of science, who bashfully insist that we should only stand and wait.

Moreover, the movement towards internationalism is vastly easier among intellectuals, especially among scientists, than in any other quarter. The social sciences will have a major role in planning the working basis of a lasting peace, and a psychology equipped to see man as man wherever he is, regardless of recrimination and demand for vengeance, will be in a peculiarly favorable situation to study the common properties of a durable post-war civilization. The leadership will come largely from our own land, but it will utilize psychologists, social scientists, educators of Britain, the Soviet Union, China, and Latin-America, and those anti-fascist psychologists, social scientists, and educators of Germany, Italy, and Japan, who have suffered ostracism and torture in these

terrible years in opposing the totalitarian regimes. We cannot today reach out our hands to all of them. Tomorrow we can, and today is the day to plan. The American Psychological Association adopted, in the opening week of the War in September 1939, a vigorous resolution for the reconstruction of world psychology at the earliest possible moment. I am asking that we set our hands to much more than this, namely the study of the human situation in the post-war world, and assisting through our researches, in the discovery of the practical ways of maintaining a peace which is not only economically, but psychologically sound.

When the question arises, "Just how practical is all this?", the answer, I believe, is that the bitter experience of the last few decades has shown ever more clearly that reconstruction on an economic and military basis alone is *not* practical, that a reconstruction based on a very much deeper study of human needs, the basis of human interrelations, is the only thing that is practical at all. Psychology has its supreme opportunity to relate itself organically to the needs of the civilization for which it has arisen, and perhaps to stabilize, strengthen, humanize that civilization.

MAN'S CREATIVE YEARS IN PHILOSOPHY

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Ohio University

I. Introduction

This study attempts to ascertain the chronological ages at which really distinguished and representative philosophers have made their most notable, or significant, philosophical contributions. The most important philosophers were identified by canvassing more than 50 standard books which deal with the history of philosophy. The foregoing procedure assumes: (1) that no single authority is an absolutely safe guide; (2) that by a careful collation of a large number of authoritative lists one can sift out the questionable names and be sure that no very important names have been overlooked; and (3) that the collective judgment of experts is likely to be more valid than are individual judgments when taken singly. It is the belief of the present writers that a philosopher whose writings are mentioned and discussed in many of the standard histories of philosophy is likely to be more important as a philosopher than is another individual whose philosophical writings are mentioned and discussed in only a few histories of philosophy.

II. The Most Distinguished Philosophers

Column I of Table I presents the names (obtained by the foregoing procedure) of the outstanding philosophers of the past 500 years, listed by nationality and ranked according to three different criteria. In Table I the representatives of the several national groups are listed separately because the data for the men of different nationalities are not directly comparable. This situation arises from the fact that, for example, more of the 50 histories of philosophy were written by English than by French or by Italian historians. Therefore, in some

Table I

Outstanding philosophers from various countries, ranked separately* by use of three different criteria, as follows: (*A*) Rank according to the number of times that the individual's 'best' work was mentioned and discussed in the 50 histories of philosophy, (*B*) Rank according to the number of times that the individual's entire output of philosophical works was mentioned and discussed in the 50 histories of philosophy, and (*C*) Rank according to the number of critical works devoted to each man or to his writings as found in Baldwin s *Dictionary of Philosophy and Psychology*.†

	(*A*)	(*A*) Rank	(*B*)	(*B*) Rank	(*C*)	(*C*) Rank
English						
John Locke	44	1	117	4	9.0	1
Thomas Hobbes	40	2	142	3	6.25	4
David Hume	38	3½	180	1	8.0	3
Herbert Spencer	38	3½	70	7	8.75	2
Francis Bacon	29	5	88	6	6.0	5½
John Stuart Mill	27	6	147	2	6.0	5½
George Berkeley	24	8	112	5	4.25	7
Adam Smith	26	7	48	8	1.0	8
German						
Immanuel Kant	41	1	297	1	61.75	1
A. Schopenhauer	27	2	86	6	14.75	2
G. W. F. Hegel	24	3	123	4	10.5	5
J. G. Fichte	21	4	166	2	7.5	6
G. W. Leibnitz	20	5	137	3	11.75	3
E. von Hartmann	17	6½	70	7	11.50	4
R. H. Lotze	17	6½	88	5	3.66	7
Baron von Holbach	16	8	32	8	0.5	8
French						
René Descartes	35	1	142	1	11.0	1
August Comte	30	2	74	3	4.0	3
C. A. Helvetius	25	3	39	8	0.75	7
J. J. Rousseau	24	4	101	2	5.0	2
Chas. de S. Montesquieu	23	5	45	6	1.0	5½
E. B. de Condillac	22	6	59	5	1.0	5½
Nic. Malebranche	18	7	68	4	2.5	4
J. O. de Lamettrie	17	8	44	7	0.33	8
Dutch						
Baruch Spinoza	33	1	97	1	16.5	1
Hugo Grotius	24	2	32	2	0.67	2
Italian						
Giordano Bruno	10	2	75	1	5.0	1
N. Macchiavelli	14	1	25	2	2.5	2
American						
William James	15	1	89	1	‡	‡
Josiah Royce	12	2	67	2	‡	‡

* The representatives of the several national groups are listed separately because, for reasons stated in the body of this article, the data for the men of different nationalities are not directly comparable.

† The numerals in Column (*C*) denote the columns of space that were required to list the names of works devoted to each man and his writings.

‡ William James and Josiah Royce were not found in Baldwin's *Dictionary of Philosophy and Psychology* because the latter work included the names of deceased men only and James and Royce were both living at the time of its publication.

instances perhaps, the works of a given English philosopher may have been mentioned and discussed more frequently than the works of a French or of an Italian philosopher merely because of nationality rather than because of greater philosophic profundity.

A number of age-curves each of which was based upon data obtained from a single history of philosophy were constructed. Some of these curves attained their peaks at one age level; other curves attained their peaks at younger or at older age levels. Therefore, in addition to studying age-curves that were based upon various separate histories, the writers constructed a number of age-curves using data obtained from a composite study of more than 50 histories of philosophy. This latter procedure utilizes the collective judgments of historians who have published their evaluations under their own signatures and who must, therefore, have tried conscientiously to cite and to discuss the more important philosophical treatises.

In what follows it is assumed: (1) that this large number of independent critics have exhibited no constant prejudice for or against any one particular age group, and (2) that careful tabulation of the number of different histories in which a given philosophical treatise was mentioned and discussed should enable one to identify the really great philosophical works.

Table II sets forth some sample data that were obtained by means of the foregoing procedure, namely, the titles of certain philosophical writings that were mentioned and discussed in a great many histories of philosophy. Table II reveals that only three philosophical treatises appeared as many as 40 times in the composite list, *e.g.*, were mentioned and discussed in as many as 40 different histories of philosophy. This apparent lack of unanimity on the part of the historians is due in part to the fact that some of the histories that were consulted dealt only with the history of philosophy of some one country. This latter statement should explain why no one treatise could possibly have been cited and discussed in each of the 50 histories of philosophy that was em-

TABLE II

Outstanding philosophical writings by philosophers from various countries, the number of different histories of philosophy that mentioned and discussed the writings, and the chronological ages of the authors at the time the work was either written or first published.

Title	No. Books Discussing It	Ages of Authors
English		
John Locke: "An Essay Concerning Human Understanding"	44	38–58
Thomas Hobbes: "Leviathan"	40	52–63
David Hume: "A Treatise of Human Nature"	38	21–25
Herbert Spencer: "System of Synthetic Philosophy"	38	40–76
Francis Bacon: "Novum Organum"	29	46–59
John Stuart Mill: "Utilitarianism"	27	42–57
German		
Immanuel Kant: "Critique of Pure Reason"	41	46–57
Arthur Schopenhauer: "The World as Will and Idea"	27	31
G. W. F. Hegel: "Science of Logic"	24	42–46
J. G. Fichte: "Basis of the Entire Science of Knowledge"	21	32
G. W. von Leibnitz: "Nouveaux essais sur l'entendement humain"	20	58
R. H. Lotze: "Microcosmus: Ideas for a History of Nature and a History of Humanity"	17	39–47
Eduard von Hartmann: "Philosophy of the Unconscious"	17	25
French		
René Descartes: "Meditationes de prima philosophia, etc."	35	45
Auguste Comte: "Cours de philosophie positive"	30	32–44
J. J. Rousseau: "Contrat social"	24	50
C. A. Helvetius: "De l'esprit"	25	43
C. de S. de Montesquieu: "De l'esprit des lois"	23	39–59
E. B. de Condillac: "Traite des sensations"	22	39
N. Malebranche: "De la recherche de la vérité"	18	36
Dutch		
B. Spinoza: "Ethica ordine geometrico demonstrata"	33	23–43
Hugo Grotius: "De jure belli et pacis"	24	42
Italian		
N. Macchiavelli: "Il Principe"	14	44
Giordano Bruno: "Della Causa, Principio e Mondi"	10	36
American		
William James: "The Will to Believe and Other Essays in Popular Philosophy"	15	55
Josiah Royce: "The World and the Individual"	12	45–46

ployed for making the composite list. The data that are presented in Table II are merely a sample of what was to be found in the composite list, which list included more than 200 pages of type-written data.

III. THE PHILOSOPHER'S ONE BEST PHILOSOPHICAL TREATISE

For each philosopher who wrote at least one book which appeared as many as 12 times in the composite list, *e.g.*, was discussed in as many as 12 different histories of philosophy, the philosopher's one best treatise was ascertained. In se-

lecting the philosopher's one best work it was assumed that the one treatise by a given philosopher which was discussed in the largest number of histories was that particular philosopher's one best treatise. In this manner the 52 best books of 52 deceased major philosophers were identified. Figure 1 reveals the average number of these best philosophical works that were either written or first published during each five-year interval of the authors' lives.[1]

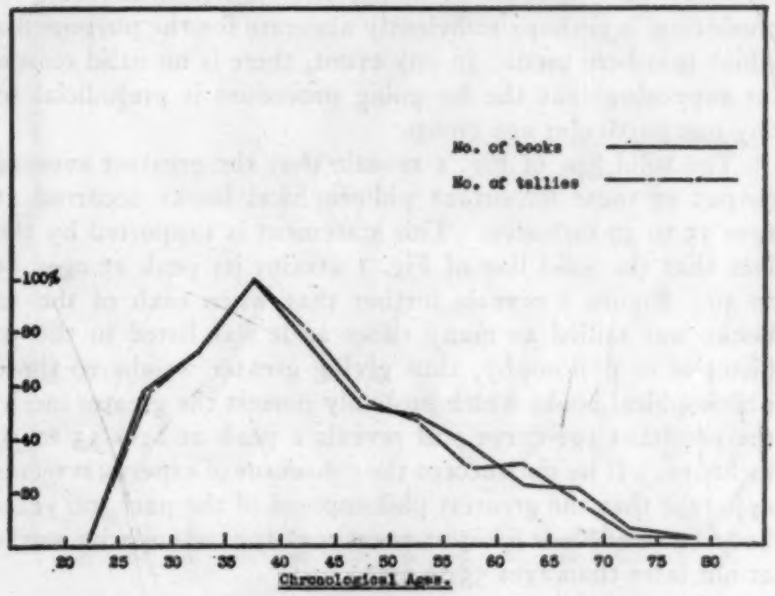

FIG. 1. The one book (by each of 52 deceased philosophers) that was most frequently mentioned and discussed (*i.e.*, in 12 or more of 50 standard histories of philosophy).

In constructing the solid line of Fig. 1 each of the 52 books was counted once only; in constructing the broken line of this

[1] Units of five-year intervals will be used for the following curves unless otherwise specified. In constructing the graphs that accompany this article, the data for each of them were first reduced to a comparable basis by the following procedure: The peak of each statistical distribution was arbitrarily assigned a value of 100 per cent and the other averages within the same statistical distribution were then assigned proportionate percentage values. For example, in Fig. 1, the peak of the distribution that is pictured by the solid line occurred at ages 35 to 39 inclusive. This modal value was taken to be 100 per cent and the remaining frequencies by age-group were then computed and plotted as percentages of the modal value.

figure each of the 52 books was tallied as often as it was mentioned.[2] That is to say, if a particular philosophical work was cited and discussed in 12 of the histories, that particular work was counted 12 times in the construction of the broken line of Fig. 1.[3] This latter procedure is based upon the assumption that those books which were cited and discussed by more of the historians probably possess greater merit than do those which were mentioned and discussed by fewer historians. This measure of merit, although it is obviously a crude one, is perhaps sufficiently accurate for the purpose for which is is here used. In any event, there is no valid reason for supposing that the foregoing procedure is prejudicial to any one particular age group.

The solid line of Fig. 1 reveals that the greatest average output of these important philosophical books occurred at ages 35 to 39 inclusive. This statement is supported by the fact that the solid line of Fig. 1 attains its peak at ages 35 to 39. Figure 1 reveals further that when each of the 52 books was tallied as many times as it was listed in the 50 histories of philosophy, thus giving greater weight to those philosophical books which probably possess the greater merit, the resultant age-curve still reveals a peak at ages 35 to 39 inclusive. If we may accept the consensus of experts, it seems apparent that the greatest philosophers of the past 500 years have attained their greatest average output of superior works at not later than ages 35 to 39.[4]

[2] Throughout the present article the statement "as many times as it was mentioned" has reference to *the number of different histories* in which a given philosophical work was mentioned and discussed. No count was made of the number of times a given philosophical work was mentioned and discussed within the covers of any one book.

[3] This manner of constructing the two curves holds for all of the subsequent figures.

[4] The chronological ages at which the philosophers *wrote* their works were employed whenever the information was available. But the dates of first publication had to be used in many cases because the dates of composition were not always available. Obviously, the dates of first publication do not tell the exact chronological ages at which the philosophers were experiencing their most brilliant insights, for the development of a philosophical system must often require a considerable amount of time. And an author sometimes encounters difficulty and delay when trying to find a publisher. Our statistical distributions therefore fail to tell the precise ages of the philosophers at the time they attained their best insights. The only thing that can be asserted with certainty is the fact that, as regards their most profound philosophical insights, these philosophers attained their highest average productivity when they were *not more than*

For 120 minor philosophers, *none* of whom had written a book that appeared in as many as 12 different histories of philosophy, the philosopher's one best writing was identified in the manner that has been described in a preceding paragraph. Each of these 120 minor philosophers wrote at least one book which was mentioned and discussed in not less than 5 nor more than 11 of the 50 histories of philosophy. Figure 2 presents the findings for these 120 minor philosophers.

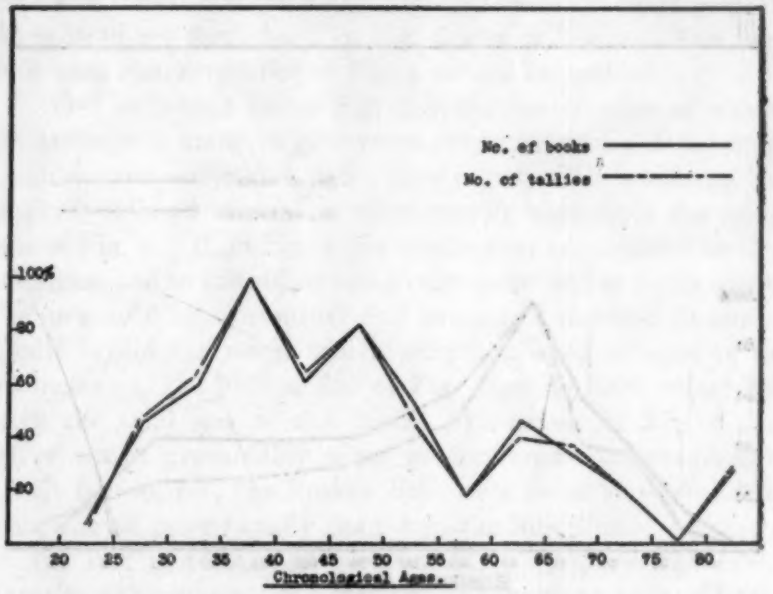

FIG. 2. The one book (by each of 120 other deceased philosophers) that was most frequently cited and discussed (*i.e.*, in from 5 to 11 of the 50 histories of philosophy).

Figure 2 corroborates the findings that are set forth in Fig. 1 in almost every respect. For both the major and the minor philosophers the one best philosophical treatise seems to have been either written or first publsihed most often (on the aver-

35 to 39 years of age. With reference to the problem of time-lag Wechsler has commented in like vein: "Leonardo is said to have spent 14 years on *The Last Supper*, Dante no less than 20 on his *Divine Comedy*, and Darwin almost as long on his *Origin of Species*. Who can say at what moment they showed their greatest brilliance? The only thing that can certainly be asserted is that, with the completion of these works, these moments must already have passed" (16, p. 93).

age) when the philosopher was from ages 35 to 39 inclusive. This finding is all the more impressive when it is remembered that Figs. 1 and 2 set forth data for two entirely different groups of men.

Figure 3 sets forth similar data for 241 other deceased philosophers, each of whom wrote only one book which was mentioned and discussed in the 50 histories of philosophy. The 241 books were each mentioned and discussed in from one to four different histories. In the construction of Fig. 3 and

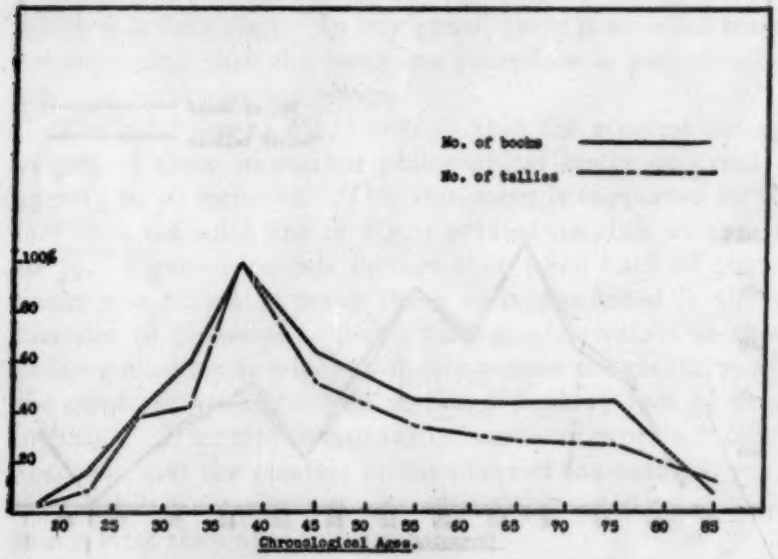

FIG. 3. The one book (by each of 241 other deceased philosophers) that was most frequently mentioned and discussed (*i.e.*, in from 1 to 4 of the 50 histories).

in the present discussion thereof, it is assumed that, if a given philosopher wrote only one book that received mention in the 50 histories of philosophy, that particular book must have been the best, or almost the best, philosophical work that was written by that particular philosopher.

Figure 3 has been smoothed from ages 40 to 89 inclusive, by taking ten years, instead of the usual five, as the unit of classification. This procedure increases the number of cases in each of the older age groups. Irregularities are thus elim-

inated, and the general trend of the age differences is brought out more clearly.

It seems obvious that Figs. 1 and 2 are based upon philosophical works that possess greater merit than do the books that were employed for the construction of Fig. 3. Nevertheless, Fig. 3 reveals again that the philosopher's one best philosophical treatise is more likely to be either written or first published at ages 35 to 39 than at any other five-year interval. In this respect Fig. 3 corroborates the findings that have been set forth both in Fig. 1 and in Fig. 2. The two following characteristics of Fig. 3 should be noticed:

(1) The broken line of Fig. 3, in the construction of which an attempt is made to give extra credit to works of superior quality, rises somewhat more slowly and, after attaining its peak, it falls off somewhat more rapidly than does the solid line of Fig. 3. If, in Fig. 3, the works that are credited to the youngest and to the oldest age groups possessed as much merit (as measured by consensus) and hence had received as much credit as did the works which were published at ages 35 to 39 inclusive, the broken line of Fig. 3 would have coincided with the solid line of this figure. However, in Fig. 3 the curve which presumably gives greater credit where greater credit is due, *i.e.*, the broken line, rises more slowly and it also falls off more rapidly than does the solid line.

(2) In Fig. 3 both age-curves start at a younger age level, namely, at ages 15 to 19 instead of at ages 20 to 24, and both curves sustain themselves better at the uppermost age levels than do any of the four age-curves of Figs. 1 and 2. This finding suggests that, although a philosophical treatise that is either written or first published prior to age 20 or subsequent to age 80 may be a particular individual's best philosophical work, such a treatise is not likely to be mentioned and discussed in many standard histories of philosophy.

The characteristics of all these curves seem to reveal a very general principle, namely, that man's best creative thinking is likely to be achieved on the average during a relatively narrow age-range, and the more noteworthy the performance,

the more rapidly does the resultant age-curve descend after it has attained its peak.

In addition to the procedure that has been described in the foregoing paragraphs, the philosophers' principal writings were also identified by noting the frequency and the unanimity with which the historians characterized a particular book as the author's 'chief work,' 'principal work,' 'most important work,' and the like. Figure 4 is based upon data

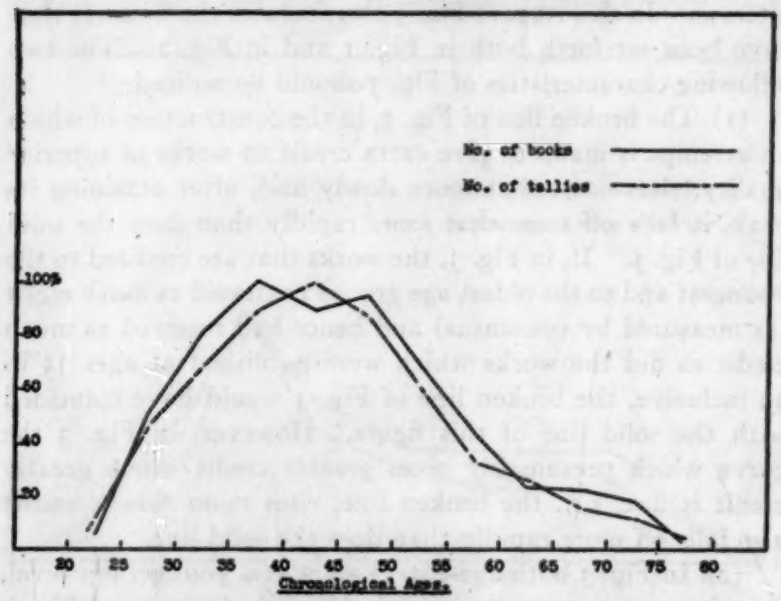

FIG. 4. Data for 128 philosophical works each of which was alleged by one or more of the 50 historians to be the particular author's 'chief work,' 'principal work,' 'most important work,' and the like.

thus obtained for 128 works by 128 deceased individuals. The two age-curves that are set forth in Fig. 4 were constructed in the same manner as were the curves in Figs. 1 to 3 inclusive. It will be noted that, although the solid line of Fig. 4 attains its peak at ages 35 to 39, this solid line does not start its decline as early in Fig. 4 as did the solid lines of Figs. 1 to 3 inclusive. Moreover, the broken line of Fig. 4 attains its peak at an older age level than do the broken lines of Figs. 1 to 3 inclusive. These two characteristics of Fig. 4 are

probably due in part to the fact that about 10 per cent of the books that were employed in the construction of this figure were included merely because a single individual asserted that these were the authors' most important works. Inclusion of books upon this latter basis probably gives too much weight to individual judgments.

Figures 1 to 4 inclusive are based upon only one book per author. Figure 5, on the other hand, presents data for all of

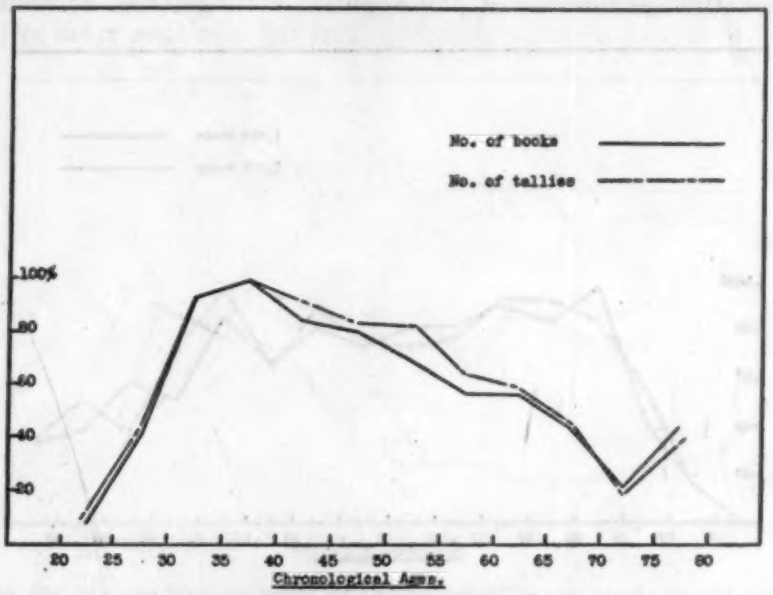

FIG. 5. Data for 122 philosophical treatises each of which was mentioned and discussed in 12 or more of the 50 histories of philosophy. The 122 treatises were the work of 52 deceased philosophers.

the 122 philosophical treatises which were mentioned and discussed in as many as 12 of the 50 histories. The 122 philosophical works that were employed for the construction of Fig. 5 were written by 52 deceased philosophers.[5] It will be noted that the solid line and the broken line of Fig. 5 almost coincide. Figure 5 reveals that, although a given individual

[5] It is of interest that most of the philosophers whose works are discussed herein are men. In so far as the present writers are aware, we have had few outstanding female philosophers. It is also of interest that few great philosophical treatises are the work of collaborators.

may write more than one great philosophical work, the more important treatises are more likely to be produced at ages 30 to 39, than at any other age interval of equal length.

IV. Quantity Versus Quality of Output

In preparing a bibliographical list of philosophical writings, Professor Benjamin Rand has listed practically everything that a given author has published (1). Figure 6 sets forth the average number of philosophical writings (first editions

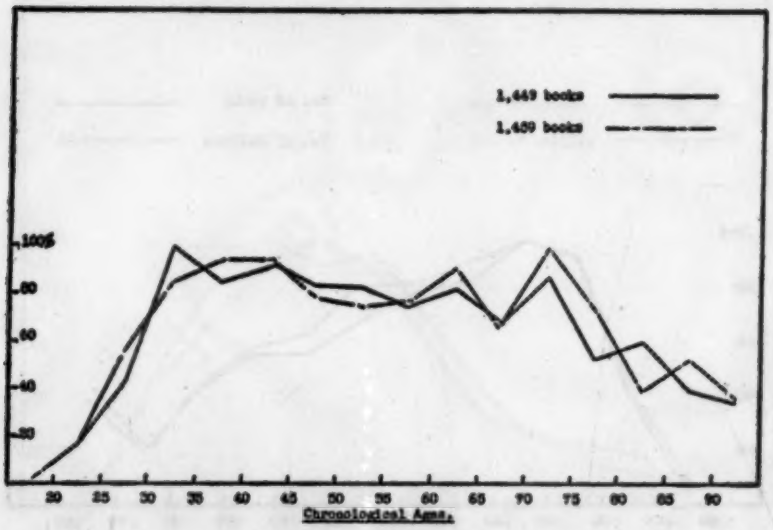

Fig. 6. Age-curves which present data for almost the total amount of the authors' philosophical writing. Data from Baldwin's *Dictionary of Philosophy and Psychology*. (*A*) Data for 1,449 books by 162 individuals, and (*B*) Data for 1,459 books by 178 other individuals. First editions only.

only) that were either written or first published per five-year interval of the authors' lives, the data having been obtained from Rand's fairly complete bibliography. The solid line of Fig. 6 was obtained by using data from the first half of Rand's bibliography, namely, 1,449 works by 162 philosophers, an average of 8.92 works per individual. And the broken line of Fig. 6 was obtained by using data obtained from the last half of this list, namely, 1,459 writings by 178 deceased philosophers, an average of 8.20 works per individual. The data

were partitioned in this manner and the two age-curves were drawn in order to ascertain whether the curves thus obtained would exhibit much similarity. Study of Fig. 6 reveals that the two age-curves that are obtained when the data are thus partitioned are very similar in shape. Figure 6 reveals also that when an age-curve is drawn by use of data obtained from a bibliography that lists more than an average of 8 philosophical works per author, the resultant curve exhibits no very definite peak. On the contrary, both of the curves of Fig. 6 are relatively flat from ages $32\frac{1}{2}$ to $72\frac{1}{2}$ inclusive.

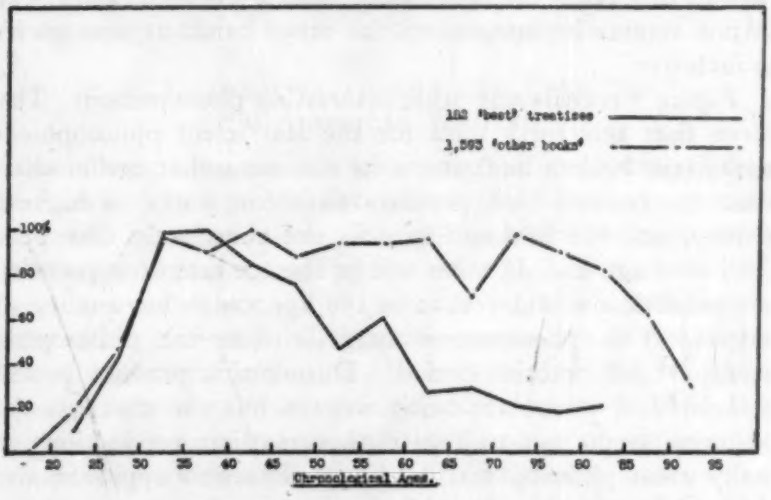

FIG. 7. Quantity versus quality of output. (*A*) The one best treatise (as determined by consensus) by each of 182 deceased philosophers, and (*B*) The ages at which these same 182 men first published 1,593 'other books,' an average of 8.75 'other books' per man.

In Fig. 7 the solid line sets forth the chronological ages at which 182 deceased philosophers either wrote or first published their one best philosophical treatise, *i.e.*, the one treatise which was most frequently cited and discussed in the 50 histories of philosophy. The broken line of Fig. 7 presents, on the other hand, the ages at which *these same 182 philosophers* either wrote or first published an aggregate of 1,593 other philosophical works, the average number of these other works per author being 8.75. These 1,593 other philosophical works

were compiled by Banjamin Rand and published in Part I, Vol. 3, of Baldwin's *Dictionary of Philosophy and Psychology* (1). To repeat, in Fig. 7 the solid line reveals the chronological ages at which works of highest quality are most often produced; the broken line reveals, on the other hand, quantity of output at successive chronological age intervals.

It will be noted in Fig. 7 that the curve which is based upon the works of superior quality is highest at ages 35 to 39, and that the average output of the superior philosophical works is almost as great at ages 30 to 34 as it is at ages 35 to 39. In this figure the broken line, which sets forth quality of output attains its apogee, on the other hand, at ages 40 to 44 inclusive.

Figure 7 reveals one other interesting phenomenon. The curve that sets forth data for the less select philosophical works (the broken line) starts its rise somewhat earlier than does the curve which presents data for works of highest quality, and the broken line does not completely disappear until after age 90. In other words, the age range for quantity of production is wider than is the age range for quality of output. This phenomenon suggests that the philosopher needs a brief practice period. During this practice period philosophical works are being written but the concensus of posterity seems not to regard these earliest productions as really great philosophical treatises. It seems apparent also that, although the 182 philosophers continued to publish during their later years, their later works are less likely to be mentioned and discussed in the histories of philosophy than are the works that are published by them at ages 30 to 39. The fact that some of these 182 philosophers continued to write and publish during their very advanced years implies that these men had not lost all desire to write. On the other hand, one cannot be sure that these men were maximally motivated during their later years.

Study of the seven graphs that have been presented thus far seems to justify the following generalizations: (1) The peak of an age-curve which presents data for philosophical works of the highest merit is likely to be somewhat narrow or

pointed, and to occur at not later than ages 35 to 39; (2) The quality of the philosopher's output falls off at an earlier age level than does the quantity of his output.

It is easy to understand why an age-curve that presents almost the entire output of a group of philosophers rises at a relatively early age level and falls off only at a very advanced age level. To write a very large number of books, an author must continue to write and publish over a period of many years. But why do the curves for the most select philosophical wirtings exhibit their relatively narrow peaks at ages 35 to 39 inclusive? This is a question for which the present writers are unable to find a very satisfactory answer.

V. Chronological Age and Type of Philosophical Writing

An attempt was made to ascertain the chronological ages at which various *types* of select philosophical works have most frequently been produced. The philosophical treatises were classified according to type by Professor W. S. Gamertsfelder.[6] Figure 8 reveals the chronological ages at which 90 logicians either wrote or first published 126 outstanding works in the field of logic. In preparing the curves of Fig. 8 and the following curves no book was included unless it was cited and discussed in two or more of the 50 histories of philosophy. Those books which were found to be cited only once in the 50 histories were ignored in drawing Fig. 8 because it was assumed that if a given book on logic were judged worthy of mention by only one of the 50 historians, that particular book

[6] Dr. Gamertsfelder has also provided the following explanatory account with reference to his procedure: "In the process of classification I have tried to detect whether the title suggested definitely a work in logic, ethics, esthetics, social philosophy, or metaphysics, and, if it did not, the work was classified under the term 'general.' Under social philosophy were classified all titles which suggested such fields as philosophy of the State, philosophy of history, philosophy of law, philosophy of education, philosophy of religion, and works on anthropology. In a word, social philosophy was regarded as an attempt to discuss institutional values. Thus, a philosophy of economic institutions was classified as social philosophy. Under metaphysics were classified titles which suggested cosmology, ontology, and in many cases axiology, especially if the title could not be classified under ethics or social philosophy. Titles which seemed to deal with some phase of theory of knowledge were classified as logic, or metaphysics, or general as the wording of the title seemed to suggest, or in accordance with the classifier's personal knowledge of the work."

would be less likely to possess genuine merit than would another book that was cited and discussed by two or more of the 50 historians. The technique that was used for constructing the broken and the solid lines of Fig. 8 has been previously described.

In general, the two curves of Fig. 8 do not differ markedly in shape. Both curves attain their peaks at ages 35 to 39.

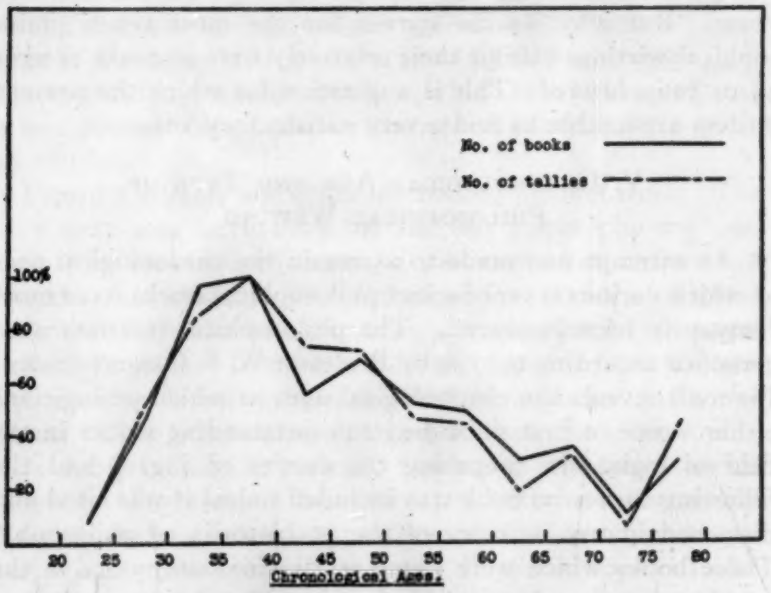

FIG. 8. *Logic.* The ages at which 126 books on logic were produced by 90 different authors. No book is included in this statistical distribution unless it was cited and discussed in two or more of the 50 histories.

The final rise of these two curves at ages 75 to 79 is due chiefly to the fact that Thomas Reid published his *Essays on the Intellectual Powers of Man* when he was more than 75 years of age. However, it is possible that Reid wrote these essays over a period of years and that it is, therefore, not wholly valid to credit them to the age group that receives credit for them in Fig. 8, namely, age group 75 to 79.[7]

[7] The problem of time-lag between date of composition and date of publication has received previous comment. L. M. Terman cites the following very extraordinary instance of time-lag. "At the age of 70, when on a diplomatic mission in England, he

Figure 9 sets forth the ages at which 95 deceased philosophers either wrote or first published their one best book on ethics as determined by the consensus of experts. Most of what has been said in describing Fig. 8 is applicable also to Fig. 9. James Martineau's book, *Types of Ethical Theory*,

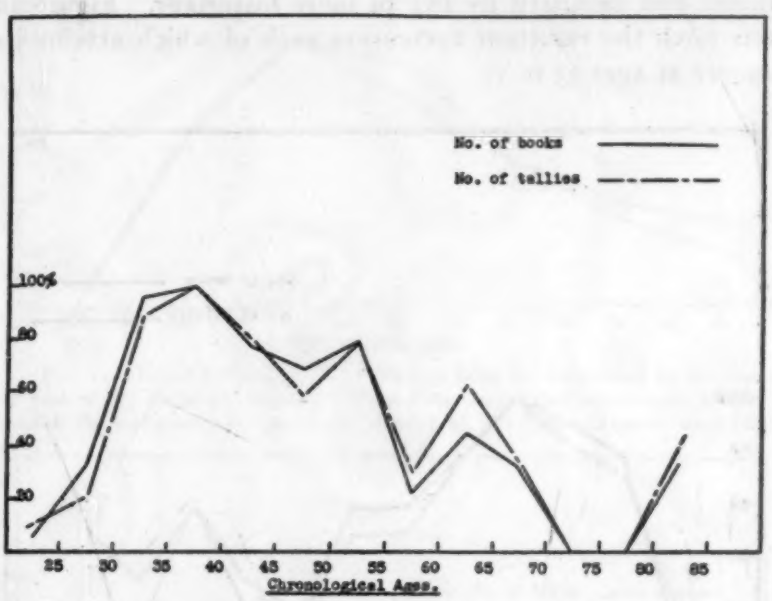

FIG. 9. *Ethics.* The one best book (as determined by consensus) by each of 95 philosophers who wrote books in the field of ethics. Each of the 95 books was cited and discussed in two or more of the 50 histories.

which was published by Martineau at age 80, is responsible for the final rise of both curves at ages 80 to 84.[8]

Only 38 books which dealt with esthetics were cited in as many as two or more of the 50 histories of philosophy. In

[Benjamin Franklin] dug up an article which he had written in his teens, published practically without change, and created a political sensation" (15, p. 296).

[8] With reference to Martineau's publications Rudolf Metz has written as follows: ". . . those works upon which Martineau's philosophical reputation almost exclusively rests are the works of a very old man, and there can surely be no other case of a man's highest creative productivity falling between the eighth and ninth decades of his life." But an editorial note by J. H. Muirhead makes the following comment with reference to Metz's assertion: "This is not quite true. His [Martineau's] chief philosophical works were not published till after he resigned the Principalship of the College, but for many years before their contents had formed the material of his lectures" (13, p. 208).

order that a trustworthy age-curve for the production of really superior works in esthetics might be obtained, 12 additional books which dealt either entirely or in part with the history of esthetics were examined. This further study yielded a grand total of 91 books on esthetics each of which was mentioned and discussed by two or more historians. Figure 10 sets forth the resultant age-curves each of which attains its apogee at ages 35 to 39.

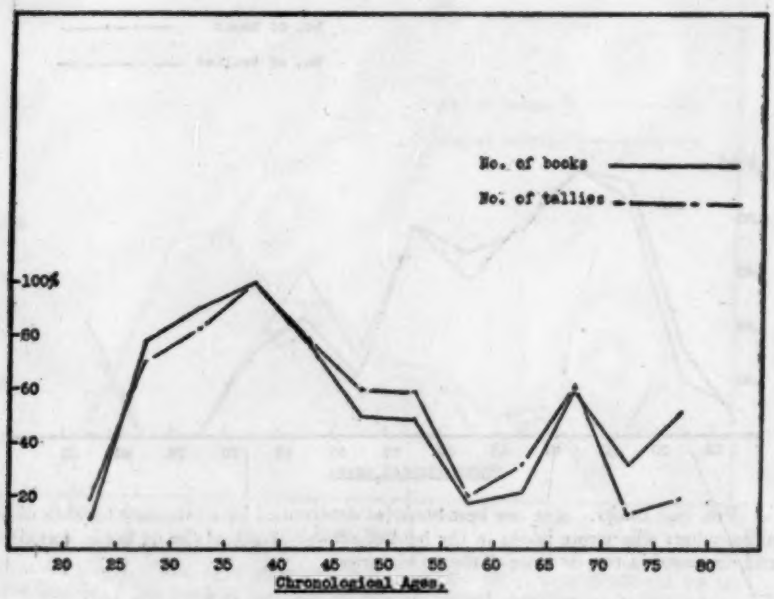

FIG. 10. *Esthetics.* The ages at which 91 books on esthetics were produced by 72 different authors. No book is included in this distribution unless it was cited and discussed in three or more histories.

The one most frequently cited and discussed book on social philosophy by each of 177 deceased individuals was identified in the manner previously described. Figure 11 presents the findings. Both curves of Fig. 11 were drawn by taking ten years, instead of the usual five, as the unit of classification. Irregularities are thus eliminated and the general trend of the age differences is thus brought out more clearly. Both of the curves of Fig. 11 attain their peaks between ages 35 and 44.

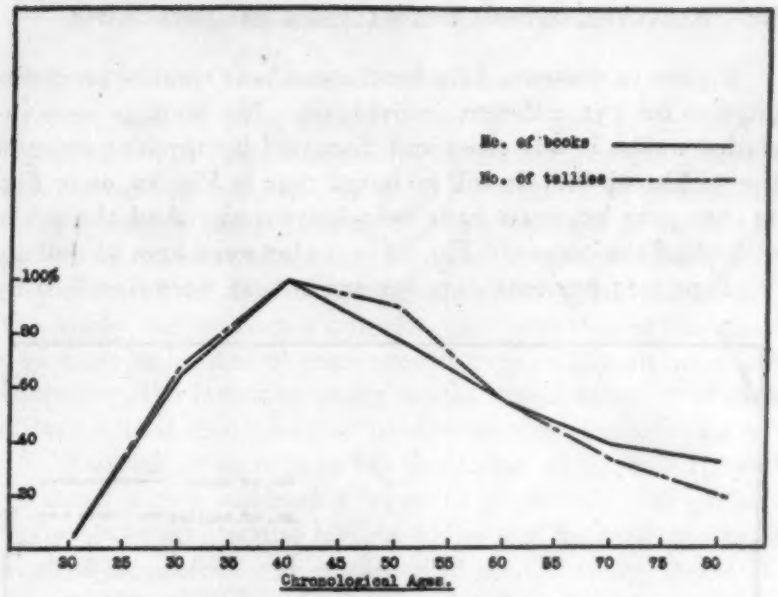

FIG. 11. *Social Philosophy.* The one best book (as determined by consensus) by each of 177 social philosophers. These data are grouped by ten-year intervals. Both of the peaks occur at ages 36–44. Each book was discussed two or more times.

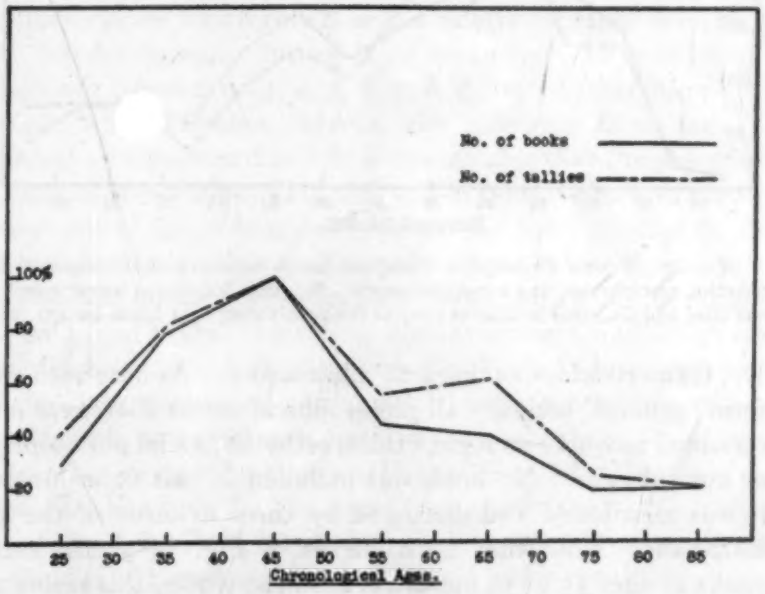

FIG. 12. *Metaphysics.* The one best book (as determined by consensus) by each of 131 metaphysicians. The data are grouped by ten-year intervals. The peaks of both curves occur at ages 40–49. Each book was discussed three or more times.

Figure 12 presents data for the one best treatise on metaphysics by 131 different individuals. No book is here included unless it was cited and discussed by three or more of the 50 historians. It will be noted that in Fig. 12, as in Fig. 11, ten-year intervals have been employed. And the peaks of both of the curves of Fig. 12 occur between ages 40 and 49.

Figure 13 presents data for works that were classified by

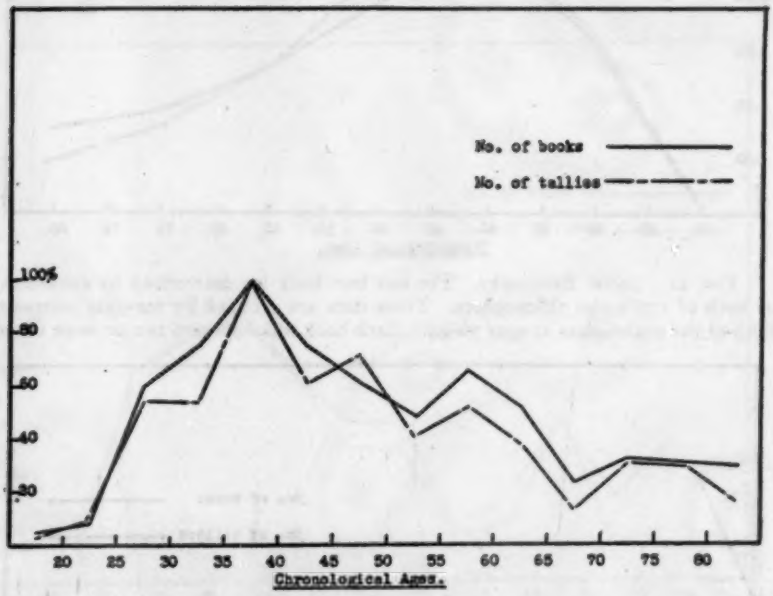

FIG. 13. *General Philosophy.* These two curves exclude works on logic, ethics, esthetics, metaphysics, and social philosophy. No book is included herein unless it was cited and discussed in three or more of the 50 histories. 301 books by 170 men.

Dr. Gamertsfelder as 'general' philosophy. As here used the term 'general' includes all philosophical works that were not classified as works on logic, ethics, esthetics, social philosophy, or metaphysics. No book was included in this figure unless it was mentioned and discussed by three or more of the 50 historians. Note that both curves of Fig. 13 attain their peaks at ages 35 to 39 inclusive. On the whole, this seems to be the most favorable five-year interval for superior creative thinking in the field of philosophy.

VI. Concluding Remarks

The layman often asks, "When is a man at his best?" When stated in this blunt manner the foregoing query makes only semantic nonsense. In order to make sense of the foregoing question the psychologist must rephrase it to read as follows: "At what chronological ages do men do their most notable work in this or in that specific line of endeavor?" Obviously, before such a question can be answered the question must be limited to some specific type of human behavior. Moreover, the behavior under consideration must be of such a nature that the behavior (or the results thereof) can be: (1) observed or recorded; (2) evaluated or appraised; and (3) dated with a reasonable degree of precision. The present study of the intellectual feats of philosophers, feats that have resulted in professional eminence of a high order, meets all three of the requirements that are listed above.

The performance age-curves that have been presented in this paper differ markedly from the well-known age-and-ability curves which reveal only a relatively slight decrement of test-intelligence during later maturity. In addition to previous comments (3, 4, 5, 6, 7, 8, 9, 10, 11) that have been made with reference thereto, the following facts may be worthy of consideration. It is conceivable that the procedure that has been employed in this and in several previous studies may reveal age differences that are far too subtle to be detected by the conventional pencil-and-paper intelligence tests which last for only a few hours at most, which can be administered (and taken) in a rather routine manner, and which can hardly be expected to elicit creative thinking of a very high order. As was stated previously, the present study concerns itself with extraordinary intellectual performance, performance that cannot be adequately evaluated by any single individual but only by the consensus of experts in the highly specialized field of philosophy. When applied to groups of individuals, therefore, this test should be an exceedingly sensitive and severe measuring instrument.

There are, however, still other reasons why the perform-

ance age-curves that have been presented herein differ markedly from the widely publicized age-and-ability curves which reveal only a relatively slight decrement during later maturity. The conventional pencil-and-paper tests were not devised for the purpose of identifying the age groups that are potentially most able to do creative thinking. Moreover, even if it were possible to devise a test that would reveal age differences in potential ability to write really great philosophical works, one would hardly expect the age-curves obtained by the use of such tests to coincide with the performance age-curves that are presented herein. Ability to perform is perhaps only one of a very large (and indeterminate) number of ingredients that make for achievement. And we are not even sure that ability is the most important single factor. (There probably is not a most important single factor.)

About the year 1916 Professor Robert S. Woodworth of Columbia University looked up the biographies of a small number of very eminent producers—writers, musical composers, engineers, generals, about 20 in all. The results seemed so definite that Woodworth ventured to incorporate the gist of them, with a few examples, in his *Dynamic Psychology* (17), and also in the following passage which is quoted from his textbook, *Psychology: A Study of Mental Life* (18).

> Seldom does a very old person get outside the limits of his previous habits. Few great inventions, artistic or practical, have emanated from really old persons, and comparatively few even from the middle-aged. . . . The period from twenty years up to forty seems to be the most favorable for inventiveness (18, p. 519).

Writing under the fictitious name, Helen Nelson, an author whose article [9] appeared in the *American Journal of Psychology* (14, p. 304) took vigorous exception to Woodworth's foregoing assertion. After arguing at length against Woodworth's statement, Miss Nelson listed a number of individuals who did notable work after they had reached the age of forty. Presumably upon the basis of her citations, Miss Nelson arrived at the following conclusion:

[9] Interest in Nelson's paper is added by the circumstance that the author thinks that its writing was directed by some intelligence outside her own.

. . . in the case of these names at least, invention of the very highest order, far from being in decay at forty, seems to be at the very prime or just ready to begin (14, p. 304).

Because Woodworth realized that his investigations had been too meager to justify so broad a generalization, Woodworth omitted the above-quoted paragraph from the second edition of his *Psychology* (19). In a personal letter to the senior author Professor Woodworth gives the following account of what happened:

I got started on the subject back about 1916 and looked up the biographies of a small number of very eminent producers—writers, musical composers, engineers, generals—about 20 in all, I think. The results seemed so definite that I ventured to incorporate the gist of them, with a few examples, in my *Dynamic Psychology*, 1918, p. 130, and also in the passage you quote from my textbook, 1921. Then, if I remember aright, Miss 'Nelson' either called on me or wrote me, urging that my statements were very misleading, and I had to admit that my investigations had been too meager to form the basis of a generalization and so omitted the paragraph from the second edition of the textbook. I prepared the following substitute paragraph, hoping to express my belief more accurately, but finally left it out:

'Another condition favorable to invention is youth, or at least comparative youth, with its openness to new impressions and its radical tendency to do something different from what has been done before. Maturity also is necessary for socially important creative work. Boys and girls seldom write, or paint, discover or invent anything of social value, not having as yet acquired the necessary groundwork of their art or science. But in the twenties or thirties, originality should show itself. Often a great producer goes on improving his style till well along in life, but most of the real novelties come from the years 25–45. It would be foolish to draw a dead line anywhere. Goethe at 80 finally writing down a scene of Faust, Second Part, which he had conceived at 30, and feeling that the delay had been desirable for the increased knowledge it had given of the world—Darwin, giving out his theory of evolution at 50 after over twenty years of collecting data to test the hypothesis which he had conceived at 28—Handel, working into his masterpiece, the *Messiah*, at the age of 56 the airs originally composed for his early operas—are instances of the effective

combination of youthful inventiveness with mature sureness of judgment, in the production of great works of invention.' [10]

This 'improving one's style' must be a very frequent phenomenon. The early works of a composer, for instance, may show the greatest break with the past, but if he keeps at this productive work, his later works may be greater works of art.

Data that have been accumulating during the past eight or ten years suggest that the foregoing statement by Woodworth can hardly be better worded. To the present writers it seems a bit uncanny that, with only about 20 biographies upon which to base his conclusion, Professor Woodworth was able to arrive at such a sound generalization.

Some readers will perhaps wonder whether (under other circumstances than those which confronted them) the groups of philosophers *could* not more frequently have attained their maximum average number of profound philosophical insights at some age level beyond 35 to 39. One must be careful here not to jump to hasty conclusions. We know only that under the conditions that did exist maximum productivity tended to occur most often at ages 35 to 39. As to what might have occurred (under the infinite number of possible hypothetical conditions that did not actually exist) the present writers have no demonstrable knowledge. The writers therefore beg the indulgence of those who would like a more detailed discussion of 'the implications' of the findings than is to be found on these pages. If the present writers' interpretation of their data seem to be somewhat cautious the reason therefor should be obvious to all.

[10] During the course of their investigation the present writers found numerous illustrations of the validity of Woodworth's foregoing assertion. In this connection it is a matter of more than passing interest that so many of the outstanding works that are listed in Table II were written over a period of years. The following statement with reference to the chief work of Montesquieu is probably applicable to a number of the works that are listed in Table II. "Montesquieu spent 19 years writing *The Spirit of Laws* and had been gathering materials for some years before attempting the actual construction of the book. Every fact was checked as carefully as possible with the facilities at his command; every idea was weighed and tested with all of his intellectual resources; every sentence and every phrase was cut and polished to gem-like transparency and brilliance. A more quotable book was never written" (12, p. 306). And F. W. Coker, in his *Readings in Political Philosophy*, says of Grotius' *De jure belli et pacis* that this book is an expansion of one of Grotius' earlier unpublished treatises, *De jure praedae* (first published in 1868). See (2).

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THE EXPERIMENTAL STUDY OF THE 'GOOD GESTALT'—A NEW APPROACH [1]

BY H. J. EYSENCK

I. Introduction—the 'Good Gestalt'

Few concepts advanced in the last few decades have aroused more interest among one group of psychological workers, and more hostility among others, than that of the 'good Gestalt.' As Petermann has pointed out, the introduction of the 'Tendenz zur guten, oder prägnanten, Gestalt' has marked at the same time the introduction of what he calls the 'Postulat von der Autarkie der Gestalt gesetzlichkeit' (**52**, 47–48); in other words, while up to then the phenomena of Gestalt perception had been treated as problems, with the introduction of the law of the 'good Gestalt' they attained the rank of explanatory concepts. Thus Wertheimer, in his attempt to formulate the laws which determine the perception of 'wholes,' gives among such unexceptionable empirical qualities of the stimulus as nearness, identity, and common fate, also the factor of the 'good Gestalt' (**66**); thus in a sense he makes use of the concept of the 'good Gestalt' in order to explain the occurrence of a 'Gestalt' at all.

All this would not matter so much if we could define the nature of this 'good Gestalt' itself more closely. But as Koffka points out, "the term 'good' is undefined. It embraces such properties as regularity, symmetry, simplicity, and others . . ." (**40**, p. 110). Thus the fundamental concept of 'goodness' is left in a mysterious, even mythical indefiniteness, and is hardly qualified to bear the large superstructure erected on it by Gestalt psychologists.

Now and then, we are given certain hints as to the essen-

[1] It is a pleasure to record my indebtedness to Professors C. Burt, K. Koffka, and C. Spearman, not only for the inspiration of their writings, but also for their invaluable suggestions, comments, and criticisms. It must not be assumed, however, that the views here advanced would necessarily be endorsed by them.

tial nature of this 'goodness'; thus we are told that regularity, symmetry, and simplicity are characteristics of it, that when a good continuation of a certain figure is prevented, "the result is æsthetically unpleasant" (41, p. 153), and that violations of the Law of the Good Gestalt "hurt our sense of beauty" (41, p. 174). But we are left with many questions. Are the 'good Gestalt' and the 'beautiful' identical? Or what is the connection between them? Is 'goodness' left undefined because enough is not known about the phenomena of perception, or is the concept unanalyzable? Are the characteristics of 'goodness' given above exhaustive, or are there others of a different kind which should be included?

In this paper, an effort is made to answer these and similar questions, with particular reference to recent experiments in the field of æsthetics. In doing so, we may hope to gain some further insight not only into the problems of perception, but also into those of æsthetics itself. For too long have students of æsthetics neglected the great store-house of knowledge which the study of perception has opened to them. If we would know why a thing looks beautiful, we must refer back to the laws which tell us why it looks green, or large, or terrifying. In fact, as Dashiell has pointed out, it would appear that progress in both disciplines would be hastened if they were treated thus together as what they actually are—two closely allied branches of the same science (14).

II. The Principles of 'Goodness'

Beauty has been defined, from the time of Plato onwards, as that which gives delight simply on being perceived. As Thomas Aquinas put it: *Id cuius ipsa apprehensio placet* (4). As regards the reason for this delight, two main theories have been advanced, one physiological, the other philosophical. It was Aristotle who first maintained that "the most perfect act is that whose energy is well disposed," thus introducing the host of theories connecting beauty with some form of distribution of nervous energy. It was Fechner who most vigorously advanced the other main explanatory concept, that of 'unity in variety' (30), in modern times, although this concept also

can be traced back to the ancient Greeks (7). Both principles have been developed by modern writers; thus the energy principle was adopted by Grant Allen (1), Marshall (49), and lately by Spearman (61), while the principle of 'unity in variety' was developed by Jodl (38) and Moore (50), and lately by Birkhoff (6). Let us examine this latter principle first.

(1) *Unity in variety.*—The principal weakness of the 'unity in variety' principle has been precisely the same as that of 'goodness': as long as we had no exact definition of either 'unity' or 'variety,' and in particular, as long as the conjunction 'in' remained undefined, the principle was entirely nebulous. It used to be said that a plate of fish and chips had both unity and variety; where, then, draw the line? An indication of how this principle could be adapted so as to come nearer to scientific requirements was given by Birkhoff, in his theory of the Æsthetic Measure (6).

He laid down that each art object, in its formal aspect, was characterized by elements of *order* and of *complexity*. What these elements were, he maintained, had to be decided afresh for each class of objects; but once such determination had been carried out, the beauty, 'goodness,' or Æsthetic Measure (M) of each object falling into that particular class was given by the formula: $M = O/C$.

Birkhoff himself suggested various *order* and *complexity* elements for poetry, polygonal figures, music, vases, etc., and his theory has been subjected to a good many tests, the results of which have been summarized elsewhere by the writer (25). Although in every case the correlation between the theoretical order given by Birkhoff's formula, and the actual order of preferences of a number of observers, was positive, the coefficients were mostly disappointingly low.

Two main reasons seem to be responsible for this failure to reach better agreement between theory and fact. (1) The definitions of order and complexity relations given by Birkhoff are purely *a priori* deductions from psychologically inadmissible premises. Thus he makes his formula for polygonal figures depend on the 'sweeping out' of the outline of

the polygon by the eye of the observer, while no such eye movements occur in fact (**46, 47, 62**).[2] (2) The relation between order and complexity indicated by Birkhoff's formula O/C is contrary to experimentally established fact. Elsewhere the writer has given a table indicating the correlations of several order and complexity elements with the empirical order of liking for polygons (**25**, p. 89); this table shows quite clearly that elements of complexity are positively and not inversely related to liking for polygons.

In spite of these drawbacks, it will be clear that Birkhoff has done a great deal to advance the understanding of æsthetics. He has tried to give an exact definition of both order (*unity*) and complexity (*variety*) elements of several classes of objects, and he has tried to give an exact determination to the conjunction 'in,' by means of his general formula O/C. Further advance is now possible in two ways: (*a*) through the *inductive* derivation of order and complexity elements, instead of through deductive argument, and (*b*) through experimental derivation of such a general formula as he envisaged.

As regards the first point, it has been possible to derive a formula for one class of objects (polygons) which accounted for practically all the non-chance factors responsible for the empirical order of liking (**25**). This formula was reached by selecting the most prominent bases of judgment, correlating each of them with the empirical other, and using these correlations as weights in a regression equation with the bases of judgment as terms. This method is of course not restricted to this type of material, but could easily be extended to other objects of art, simple and complex alike.[3]

As regards the second point, we have learned enough in recent experiments to say with a good deal of confidence that

[2] Rashevsky's formulæ for the beauty of polygons, which he derives from his general mathematico-biological theory of nervous functioning, are similarly vitiated by assumptions of this kind which run counter to our present knowledge (**56**). His presentation of the case, although more spohisticated than that of Birkhoff, is far from convincing.

[3] Complex objects might be attacked in the manner indicated by Wiley (**67**) and Jacobsen (**37**), although it might be found necessary to increase the number of bases of judgment over the small number used by them.

the general formula advanced by Birkhoff is wrong, but it will be a good while before the correct formula will be put in its place. As a first approximation, it may be suggested that $M = O \times C$ would be nearer the truth, but of course it is inevitable that the final formula will be more complicated than that. In the first place, we may expect that the class of objects concerned will be included in the formula in the form of weights, since there is every reason to assume that order and complexity relations are of very different importance for different classes of objects. Secondly, a certain difficulty arises because, by dealing with *relations* only, the formula leaves out of account the *fundaments* which are related. This does not matter in the case of polygons, where the æsthetic influence of the fundaments, *i.e.*, the lines, is of much less importance than the relations between these lines. But in the case of colour combinations, for instance, it has been shown that "the pleasantness or unpleasantness of the single colours affects the pleasantness or unpleasantness of their combinations" (**39**); indeed, the influence of the fundaments in the appreciation of such combinations has been shown to be equal to that of the relations between the fundaments (**22**, p. 683). This factor might necessitate a change in the formula.

In this discussion, we have left out one rather important consideration, namely the possibility that no such general formula as we have envisaged may exist at all. It is quite possible, the reader may argue, that each class of objects will have its own laws, quite different from those of any other class, and that therefore the search for any such general formula will of necessity be futile. While such an outcome of our investigation is quite a possible one, there are several reasons which tend to indicate that it is not a likely one. These reasons are connected with the experimentally established facts regarding the factors which determine our æsthetic appreciation, which will be discussed in section 3.

(2) *Perfect energizing.*—Spearman has made the most recent, and the most sustained, attempt to account for æsthetic pleasure in terms of the 'perfect disposal of energy,' by refer-

ence to his well-known principles of cognition. In particular, he calls on the *Law of Retentivity* and on the *Law of Fatigue*. "The principle of retentivity, which demands repetition, must be supplemented by the principle of fatigue which requires variety" (**61**, p. 48). It is thus that is created the "miracle that is multiplicity in unity; differentiation with integration." "They are as two voices that sing the whole ravishing duet of the beautiful" (**61**, p. 49). Thus Spearman goes beyond the principle of unity in variety, and attempts to find a psychological and physiological explanation for the terms of that principle in the perfect energizing brought about by the laws of retentivity and fatigue.

Tempting as Spearman's masterly exposition of this view appears, certain experimental results must make us cautious of accepting it as a true account of the facts. In particular, these experiments make the influence of fatigue a very doubtful factor. The law of fatigue is formulated thus by Spearman: "The occurrence of any cognitive event produces a tendency opposed to its occurrence afterwards." Now for such fatigue to occur, a definite amount of time is needed; at least as much time as is required by the first occurrence of the event in question, and by its second occurrence. It is possible to give an indication of approximately how much time is necessary *at the very least* in order to perceive a work of art, and to perceive it a second time, so that fatigue can set in; or alternatively, to perceive part of a work of art first, and then another part of the same work, so that repetition of some detail can produce fatigue. In the exploration of a picture, the eye fixates many points, moving from one to the other by means of the usual saccadic movements. In the simple contemplation of a circle, for instance, there are some 10 to 15 such fixations, and correspondingly more in the contemplation of a more complex work of art (**62**, **63**). The reaction time of the eye in shifting from one point to the other is usually taken as between 1/7th to 1/5th second (**17**); photographs of the eye during exposure of 1/10th second showed no shift of fixation (**15**). Actually, as Billings has shown, something like 2 seconds is spent by the observer on each object or

idea in the picture, rather than the absolute minimum of 1/10th second (**5**). Pillsbury has criticized Billings' results, and on re-examining them comes to the conclusion that 1 second would be a better average than 2 seconds for a single pulse of attention (**54**). However that may be, it is clear that, considering the number of separate objects or ideas in any picture, some considerable time must elapse before any cognitive event connected with the appreciation of the picture can occur again, thus falling under Spearman's law.

It has been shown, on the other hand, that appreciation of works of art does not require a great deal of time; in fact, *appreciation may be instantaneous*. Külpe and Ritook (**45, 57**) have shown that even during brief contemplation hedonic feeling occurred, and more recently Brighouse (**8**) and Kallett (**39**) showed that with extremely short exposures of 1/4th second hedonic responses to pictures could be obtained, and that these responses remained practically unchanged on fuller exposure. Brighouse suggested that the immediate hedonic tone was probably mediated by the recognition of the 'story-telling' content of the painting; this suggestion gained in probability because the artistically trained subjects were less hasty in their judgments than were the untrained subjects and the children tested by him.

This interpretation does not seem to fit the facts, however. The writer repeated Brighouse's experiments on three subjects chosen with particular care for their æsthetic abilities—one was an artist, and the other two had scored particularly highly on the 'T'-test of æsthetic appreciation (**26**). These subjects were shown individually 50 uncoloured paintings by a great variety of artists (mostly modern) for 1/25th second through an episcope which had been converted into a tachistoscope by means of fitting a camera shutter to it. Each picture was thrown on a vertical white wooden surface, and the subjects indicated their liking on a 5-point scale. Afterwards, the subjects were given the pictures to look at as long as they liked, and were asked to rank them again.[4]

[4] The apparatus was arranged in such a way as to eliminate after-images.

The correlations between the two series of ratings for the three subjects were .82, .76, and .80. Of about half the pictures, the subjects obtained only such a fleeting glimpse that they did not recognize the subject of the picture; in fact when shown the same picture later on they often failed to recognize it. In view of these facts it would appear that when æsthetically superior subjects are forced to make a decision as to the æsthetic worth of pictures shown only for a very brief period, they give decisions very closely similar to those arrived at after long deliberation. The reluctance of æsthetically superior subjects to judge pictures at first glance, rather than their inability to do so, seems to account for Brighouse's findings. We are left with the fact that *the appreciation of the æsthetic worth of a picture may be as instantaneous as the perception of the picture itself;* this fact makes it difficult to see how the principle of fatigue can play any part in the explanation of the occurrence of æsthetic judgments.

It would also be difficult to account for the facts of long-time inspection of pictures, and the æsthetic feelings arising from it, by having recourse to the laws of retentivity and of fatigue. Brighouse reports that on viewing 14 paintings for 96 minutes in 24 four-minute periods, 21 observers came to like modern painters considerably better, classics and romantics slightly better, and extreme abstractionists less (9). It seems difficult to relate these results causally to Spearman's theory.

We cannot, then, accept the special explanation of 'perfect energizing' in terms of Spearman's general cognitive laws, although it seems likely that any psychological theory of æsthetics will find it necessary to combine the physiological concept of 'energizing' with the philosophical notion of 'unity in variety' in some form. An attempt to do so will be made later on, but before turning to so ambitious a project it will be necessary to examine in some detail the factors which have been found to be responsible for the appreciation of æsthetic objects. With the knowledge gained, we shall be better able to account for these factors in more general terms, and to relate them to an operational definition of the 'good Gestalt.'

III. Factors of Æsthetic Appreciation

When observers of different ages, different degrees of æsthetic sophistication, different sex, different race and nationality are asked to rank in order of liking such objects as portraits, pieces of music, landscapes, poems, odours, colours, polygons, vases and the like, the most striking fact is that there is a good deal of basic agreement between their rankings. Some investigators, indeed, have failed to find such agreement; Wells, for instance, whose study is perhaps the first to be done in this connection, reports so little agreement between the rankings of his subjects that no objective criterion could be derived from them (**65**, p. 522). Similarly, Allesch denies that on the basis of his results on the judging of colour preferences it was possible to posit any degree of agreement (**2**). On calculating the correlations between the rankings reported in full by these writers, however, the present author found a good deal of agreement; the average intercorrelation between the rankings was .44 in Wells' work, and .26 in v. Allesch's study. In both cases, a prominent general positive factor was found on subjecting the table of intercorrelations to a factorial analysis; this factor accounted for 47 per cent of the variance in one case, and for 30 per cent in the other (**19**). Hence the conclusion drawn by these workers with regard to the absence of any agreement are not justified by their own results.

This persistent agreement between judges, observed also in many other instances, led Burt to assume the existence of a general, innate factor of æsthetic appreciation; this factor was to be regarded as independent of associations, training, etc. (**13**). It has been shown that an observer who scores highly on one test of visual appreciation tends to score highly on other tests also; furthermore, he is likely to score highly on tests of appreciation for odours, colours, and polygons (**26**). This general factor, running through the appreciation of various kinds of æsthetic stimuli, has been called the 'T'-factor, and appears to be the same for expert and layman alike. That this is true is shown by the fact that laymen and even young

children tend to agree on the average with the judgments of experts (**11, 16, 59**). The average judgments of a number of observers become more valid the larger their number, in conformity with a formula first proposed by Burt in a different context, and shown to be applicable to data of this kind by the present writer (**27, 28**). Intelligence is related to this general factor of æsthetic appreciation to a small but significant extent.

When this ubiquitous general factor is eliminated statistically, or preferably reduced to a minimum by the appropriate choice of experimental material (**29**), a bipolar factor is found which is almost equally ubiquitous. This factor, which is closely related to temperamental characteristics, has been called the 'K'-factor, and correlates comparatively highly with tests of introversion-extraversion (**20, 29**). It has been shown to appear in tests of appreciation for statues, portraits, landscape-paintings, photographs, odours, poetry, and polygons. Its nature is difficult to describe, but in general it would appear that the extravert prefers the simple, highly 'unified,' vividly coloured, modern type of picture; the poem with the obvious rhyming scheme and the definite unvarying, simple rhythm; the simple polygon; the strong, obvious odour. The introvert, on the other hand, prefers the complex, more diversified, less 'poster-colour' picture; the more complex polygon; the poem with a less obvious rhythm and a more variable and loose rhyming scheme; the more subtle odours (**20, 24, 25, 29**). It has been suggested that this factor may be related to v. Hornbostel's 'Brightness' factor, but there is as yet no definite confirmation of this theory.

It has been maintained by many writers on temperament that introverts and extraverts are differentiated with regard to their attitude towards æsthetics and towards humour; the introvert was regarded as lacking in sense of humour, but as having a highly positive attitude towards art; the extravert was pictured as having a good sense of humour, but a negative attitude towards art. Sisson failed to find any such difference with regard to the general factor of æsthetic appreciation (**60**), and the writer did not find any difference between introverts

and extraverts in his work on humour (**23**). As in the researches mentioned above, however, a second, bipolar factor, extracted after the first, general factor had been eliminated, divided extraverts from introverts on the basis of liking for *simple* and liking for *complex* jokes. It is not, then with respect to art or humour in general that temperamental types are distinguished, but in regard to preferences for special kinds of works of art, and special types of humour.

While the 'T' and the 'K' factors are 'communal,' in the sense that all or at least a certain number of observers agree on the ranking of the pictures or other objects which are being judged, two other factors are 'unique' in the sense that they are peculiar to each of the judges separately. Firstly, we have the 'specific' factors, which include those various individual judgments which are based on private associations and experiences. A particularly important group within this general scheme of 'specific' factors is that comprising the psycho-analytic factors. Whenever a picture or other item is ranked with a disproportionate show of emotion in a position which is greatly different from the average, one may suspect some hidden, probably unconscious, reason; in fact, such unusual rankings have been made into a 'complex' indicator for use in certain situations when individual examination is impossible (**18**). In this paper, a more detailed discussion will be found of 'specific' factors in general, and of psycho-analytic factors in particular.

Lastly, we must mention such factors as are not even stable within one and the same person from one day to another. Such 'error' factors vary widely in importance according to the class of objects under consideration; they are far more important in the ranking of colours, for instance, than in the ranking of pictures. Study of re-test correlations makes it appear likely that the greater the complexity of the items judged, the smaller the influence of 'error' factors. This is due presumably to the fact that 'group' and 'specific' factors are more easily associated with complex stimuli.

It has been argued that only the 'communal' factors can properly be called 'æsthetic' factors, while the 'unique' fac-

tors would represent extraneous influences. This question is of little interest; it is more important to know what *are* the factors which play a part in our æsthetic judgments, than to classify these factors into categories on an *a priori* basis. But can this knowledge of the factors determining our æsthetic appreciation be of any use to us in our main quest, *viz.*, with regard to the investigation of the 'goodness' of forms? To this question we must now turn.

IV. Organization in the Perceptual Field

Jodl has maintained that the "unification of a multiplicity is a fundamental law of the æsthetically effective" (**38**), and Granit made an attempt to connect this theory with his own experiments on perception under conditions of short-time exposure (**33**). Under those conditions, he found that "even primary forms of construction show a tendency toward unification"—a result well in line with the similar experiments reported by Lindemann (**48**), Hempstead (**35**), Wohlfahrt (**68**) and Rothschild (**58**), who used short-time exposure, low intensity of stimulus, small size of stimulus, and after-images in order to reduce the prepotency of external forces of perception, and to allow the internal forces of organization to manifest themselves.

These writers have stressed the *simplicity* and *regularity* of the precept resulting from the exposure of various stimuli under conditions like those mentioned above, to such an extent that we must ask ourselves: Is it only these qualities which characterize the 'good' Gestalt, *i.e.*, that Gestalt whose organization is most in accordance with the self-distribution of nervous action-currents? Or are there other qualities appearing in the reproduction which cannot be subsumed under the headings of *simplicity, symmetry, and regularity?* Certain experiments described elsewhere in some detail would seem to indicate that the above authors have found these *simple* qualities so pronounced because their original stimuli were too *irregular* and *complex*. When less complex and more regular stimuli are used, the trend of the reproductions towards

simplicity becomes correspondingly less, and may even be reversed (21).

Exhibiting polygonal forms, taken from Birkhoff, and slightly more complicated, but symmetrical and balanced drawings, for 1/50th second tachistoscopically, the present writer had his observers reproduce immediately what they saw. In some 30 per cent of the cases, certain features were made simpler, while in another 30 per cent of cases, the reproductions showed greater complexity. These results are in good accord with those reported by Fehrer, who found that progressive complication occurred in 32 per cent, and progressive simplification in 27 per cent of his reproductions (31). They also agree with such memory experiments as those of Wulf (69), Perkins (51), Allport (3), Gibson (32), Brown (10), Hanawalt (34), and Philippe (53), who found evidence of both simplification (loss of detail) and of complication (substitution of new detail).

The next step in the experiment was to have the hedonic value of the various reproductions, and of the original drawing in each case, judged by the observers.[5] The main result of the experiment was that those drawings were liked best which exhibited evidence of *both simplification and articulation simultaneously*.

Thus it would appear that we find two principles active in that self-distribution of nervous action-currents which according to Köhler lies at the basis of the 'good' Gestalt: (1) a simplifying or *order* principle, and (2) a differentiation or *complexity* principle. This thesis is powerfully reinforced by a research of Hubbell's, in which she presented various outline figures to her observers, with the instruction to alter them so as to make them as 'good' as possible, or to leave them as they were if they were already 'good' enough (36). She found increased differentiation or articulation in 68 per cent of all the changes, and simplification in 37 per cent of all the changes; accordingly she concludes that "the hitherto unemphasized factor of differentiation should be given a place

[5] The copies were of course re-drawn in order to prevent careless drawing from influencing the observers' decisions.

of greater importance as a determinant of goodness of form. The more differentiated figures have the advantage of greater structuration or articulation; too great a simplification of structure . . . is too uninteresting to be considered good" (**36**, p. 56). Here results showed that "complication may enhance, rather than destroy the whole-properties of the figure. If the added parts emphasize and elaborate the properties of the figures . . . the complication may increase the unity and coherence of the figure, and so may work towards the same end as simplification. Since both tendencies may be in the direction of better perceptual units, they are not as directly opposed to each other as might at first seem" (**36**, p. 56).

Thus we find that the same principles of order and complexity, unity and variety, integration and differentiation, simplification and articulation, or however they may be called, which we encountered in our discussion of the determinants of *æsthetic appreciation* also occur in the determination of the *good Gestalt.* Consequently we must conclude that the relation between the two is very close indeed; as Koffka puts it, *perception is artistic* (**42**, p. 261). It will create the most symmetrical, the most balanced, the most beautiful mental picture which is possible under the external circumstances obtaining at the moment; conversely, those external stimuli will be judged the most beautiful which are most in agreement with the internal forces of perception. Thus we see that the fundamental law of æsthetics derives from the Law of the Good Gestalt (Law of Prägnanz), while conversely this law of æsthetics may be used to determine the properties of the good Gestalt. If we accept this view, we are led to some such Gestalt theory of æsthetics as is elaborated in some detail in the next section. We also see at once that we have gained an important advantage with regard to the exact definition of 'goodness' which we demanded previously. Such a definition is given in that general formula, provisionally formulated as $M = O \times C$, which we sought to establish in a previous section, and in the detailed definitions of the two terms O and C in that equation. That the more exact formulation of both terms and equation lies largely in the future does not alter

the fact that in this manner the main point of attack on this principle of 'goodness' is taken away; the concept is no longer a mere will o' the wisp, but can be operationally defined and established to any desired degree of exactitude. One attempt at such an exact determination has already been made, and may here be pointed to in support of what might otherwise appear merely hopes for the future (**25**). We must now trace the consequences of the identification of the Law of Prägnanz with the fundamental law of æsthetics, and in particular we must now show what this fundamental law is.

V. The Fundamental Law of Æsthetics

If with Köhler we regard the neural sector serving the transmission of nervous impulses as a physical system, and the processes of perception as time-independent or semi-independent states, we can derive the fundamental law for these distributions from physics, and more directly from the second thermo-dynamic law. In the words of Köhler, "in all processes which terminate in time-independent states, the distribution shifts towards a minimum of energy" (**43**, p. 250). Or as Koffka puts it, "the final time-independent distribution contains a minimum of energy capable of doing work" (**41**, p. 108).

If we accept this view of the process of perception as essentially correct, and if we also accept the view regarding the relation between perception and æsthetics developed in the last section, we are led at once to the following *law of æsthetic appreciation: The pleasure derived from a percept as such is directly proportional to the decrease of energy capable of doing work in the total nervous system, as compared with the original state of the whole system.*

This law, as stated, is perhaps too general to be useful, and it will be advantageous to discuss it at some length, together with three corollaries which may be deduced from it.

1st Corollary.—An object is æsthetically pleasing in so far as it is in accordance with the self-distribution of energy in the *special sector* of the nervous system concerned.

2nd Corollary.—An object is æsthetically pleasing in so far as its perception draws off a maximum amount of energy from the *total nervous system.*

3rd Corollary.—Appreciation of æsthetic objects depends upon the *total amount of energy* present in the system, and on the *inertia* of the system.

The first corollary deals in the main with the 'order' term in our general formula. The self-distribution of energy in the special nervous sector concerned (*i.e.*, the auditory, the visual, or any other) will tend towards a minimum of energy capable of doing work, in accordance with the second thermo-dynamic law, and will therefore be as 'good' as the prevailing conditions allow. The more in agreement with such 'good' distributions the external conditions, *i.e.*, the stimuli or æsthetic objects, happen to be, the more pleasure will be experienced in the perception.

But as shown by the experiments quoted in earlier sections, this corollary is not sufficient by itself. It might be considered to account for the presence of the 'order' term in our general equation $M = O \times C$, but it does not account for the 'complexity' term. The reason for this is that so far we have treated the special sector of the nervous system concerned in isolation; in reality of course it is only part of the whole complex of sectors which go to make up the nervous system. Hence it will be necessary to change our emphasis slightly in introducing the second corollary, which also derives from the general law. We have said that the distribution of energy shifts towards a minimum; this is true only of the total system. Under certain conditions, this general rule demands that a part of the total system should absorb a maximum of energy (41, p. 108; 44, p. 533). The degree to which such a condition obtains is determined by the relative isolation of the different sectors; if they were quite independent, our first corollary would be sufficient, if they were not at all separated, our second corollary would not be different in import from the first. But in reality the position seems to be that each special nervous sector enjoys a certain degree of independence, which, however, falls far short of complete

independence. Evidence for this contention can be found in the many experiments on intersensory perception, on localization of functions in the brain, etc. Consequently, we must strike a balance between the demands of the two corollaries; the first demanding the greatest possible amount of *simplicity* in the object, the second demanding the greatest possible amount of *diversity*.

The third corollary attempts to show how this compromise between the demands of the first and the second corollary shall be effected. The greater the amount of energy present in the system, the greater the complexity or diversity required to drain off a maximum of the total energy available to the one sector concerned; this deduction is supported by experiments such as those of Weber's and of Rabson's (**64, 55**), who found a correlation between liking for complexity and intelligence.[6]

We may also surmise that the inertia of the system, as shown by the perseveration of the subject, will exert an influence on the relative importance of the two factors of simplicity and complexity, and if we accept Spearman's view that perseveration lies at the back of those temperamental differences commonly called extraversion and introversion, we may expect that preference for complex or simple stimuli will be correlated with temperamental traits of this kind. Such correlations have in actual fact been established in several experiments (**12, 20, 23, 24, 29**). Thus our theory does not only explain the general factor of æsthetic appreciation, but also the so-called 'K'-factor, and the relation between that factor and temperament. And while this theory has many shortcomings of which no one can be more conscious than the writer, it has also certain advantages which may entitle it to a hearing: It is based on experimental evidence throughout, it attempts to explain the phenomena of æsthetics on a psychological basis, and it admits of quantitative verification and extension. Above all, it points out an essentially novel approach to an old problem—that of the 'good Gestalt.'

[6] We follow Spearman in regarding intelligence as a manifestation of the energy contained in the nervous system.

VI. Summary and Conclusions

In the first section, it was pointed out that the concept of the 'good Gestalt' encountered a good deal of criticism at the moment because of its vague and indefinite character. A certain clue to a better understanding and more clear-cut definition of the term was found in certain passages linking it to the realm of æsthetics. A survey of some of the main facts and theories of present-day æsthetics seemed to show that the beautiful in its formal aspect could be defined in terms of a formula provisionally given as $O \times C$, in which O stood for *order* elements and C for *complexity* elements. This formula was shown to represent a definite advance over the older philosophical notion of 'unity in variety.' In the third section the various factors which enter into æsthetic appreciation were examined on the basis of recent experimental researches. In the fourth section, the factors active in the process of perception were discussed in the light of some new experimental evidence, and it was shown that the factors O and C, which entered into the æsthetic formula, also appeared in the perceptual process, and that consequently there existed the possibility of reducing the laws of æsthetics to those of perception, and at the same time of illuminating the field of perception by the results of experimental work in æsthetics. An attempt to carry out such a unification was undertaken in the fifth section, where a Gestalt theory of æsthetics was presented. From this theory, it was possible to derive an operational definition of 'goodness' which may be of service in countering the charges of 'vagueness' and 'meaninglessness' sometimes levelled against it.

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A CRITIQUE OF PROFESSOR CANTRIL'S THEORY OF MOTIVATION

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This study will be restricted to the basic explanatory concepts introduced by Professor Hadley Cantril in *The Psychology of Social Movements* [1] to account for social change. The stream of Professor Cantril's thinking runs along the channels cut by Professor G. W. Allport, but its impetus forces new outlets. The individual is now assimilated more directly and closely to the social structure. In this cultural stress Professor Cantril acknowledges the influence of Muzafer Sherif [2] (though the individual as a relatively independent social force is more adequately recognized, as it seems to me, than it is in Sherif's work). Professor Cantril's investigation here, as elsewhere, is characterized by the perspicacity and intimacy of a social artist and the shrewd reserve and thoroughness of a social scientist. The purpose here is to expound and examine Professor Cantril's motivational scheme in the hope that some of the 'vexing questions' one is forced to ask may be further clarified.

I. Basic Orientation

We must realize that Professor Cantril is building a motivational structure calculated to explain such social phenomena as the lynching mob, the Oxford Group, and the Townsend movement. His scheme is clearly and emphatically oriented against instinct theory, and its "fictitious, schematic man who represents abstract 'human nature,' endowed with a bundle of fixed needs or capacities." [3] Nor is he satisfied

[1] H. Cantril, *The psychology of social movements*. New York: John Wiley & Sons, 1941. All quotations are from this book unless otherwise indicated.

[2] *The psychology of social norms*, New York: Harper & Brothers, 1936.

[3] p. xi.

with approaches which "stress individuality and the variety of men's capacities and traits, but somehow neglect the relationship of men to the social context in which they live." [4] Psychological explanations, he insists, must be guided by concrete phenomena and not get 'side-tracked' by limited or questionable biological details. Hence, though Professor Cantril does not intend to 'wander foot-loose and fancy-free without any regard for the biological organism,' [5] he seeks a 'purely functional' explanation. In his own words: "The mechanistic, positivistic approach has been rejected in favor of a phenomenological analysis that hopes to straighten out in part the tangle of mental context and motivation found in the individual who is adjusting himself to the social world." [6] "The psychologist's medium is not a static human being but a dynamic and 'fluid personal and social environment." [7] This basic orientation, away from instinctive, individualistic, and physiological 'explanations,' leads Professor Cantril to regard behavior as a function of the environment and predispositions motivating the particular individual. His account of these predispositions and their relation to the environment must therefore be analyzed if we are to gain insight into this psychology.

II. The Matrix of Social Change

The very first paragraph in Chapter I, 'Mental Context,' describes the phenomena to be explained. The individual, born in an organized society, finds his life entangled in the social network from which he cannot escape. However, admitting that "almost all the experiences which constitute his life are likely to be prescribed roughly for him," we must not forget that "the individual will develop the capacity to select alternate courses of action" and change "some characteristics of his culture which are by no means to his liking." [8]

The problem arises: What guides creative selection, if in-

[4] *Loc. cit.*
[5] *Loc. cit.*
[6] *Loc. cit.*
[7] p. xii.
[8] p. 3.

deed there really can be such, where there is such 'rough' environmental prescription? Can there be a true synthesis of creativity and prescription which does justice to both aspects? Professor Cantril gives his synthesis of the two conflicting aspects in the statement: "But still this selection and this desire to alter certain practices are themselves bounded and determined by the original conditions imposed by a certain way of life." [9] In other words, creativity and selectivity are not ultimate, or not as ultimate as the basic impositions of a culture "which gradually become a part of him, use him as a carrier, and make of him a socialized person." [10]

It seems sheer bravado or quibbling to question this statement of the situation. But doubts do arise. They increase as we review one aspect of the methodological predicament in which the social psychologist almost necessarily finds himself once he sets out to study the social situation. Invariably his study of the individual takes him to the milieu in which the individual lives. However, the milieu that is accessible to the investigator is the *established one*. Yet the 'established' milieu is not the objective milieu; it is that part of the individual's total environment which observers have been able to agree upon as relatively fixed and imposed on the individual. This established portion is seen as a *restriction* on the freedom of the individual, as a channel to which the individual's plasticity must conform. These accepted norms stay in the forefront of the investigator's consciousness as he studies influences on the individual.

This procedure is adequate for many specific problems, and has a place provided we are aware of its limitations. For while established ways of living are more observable and calculable, the unexplored opportunities in a given environment remain invisible to the external observer. *For opportunities* in the last analysis are *relative to the needs and abilities of the individual*, and, in their very nature, as prospective, opportunities are not open to external observation. Thus, while the psychologist is studying the individual as 'bounded and

[9] *Ibid.*
[10] *Loc. cit.*

determined by the original conditions imposed by a certain way of life', his attention is focussed on the effect of the established mode on selective desire. Almost inevitably, therefore, the possibilities available to the desires and abilities of the individual, do not receive adequate attention. Even if a social psychologist does notice them, as does Professor Cantril, they do not affect the basic explanation. Professor Cantril, for example, formulates his observations in terms of a plastic individual who is the conscious or unconscious victim of a social super-structure "which tends so greatly to canalize the way in which the single man will talk, figure, build, dress, think, work, and play."[11] Again, "in explaining social movements, we must always look first at the particular pattern of norms which surround the individuals who compose that particular movement," and then ask: "What desires, worries, frustrations, and prejudices did their particular community or status foster?"[12] Thus Professor Cantril tends not to emphasize adequately *in theory* what needs to be emphasized if social leaders, revolutionaries, or any variants from the common pattern are to be explained.

In other words, equal theoretical attention must be given the fact that the established pattern, while satisfying the needs of the many, is evidently seen by some individual as a mere step to a larger set of possibilities inherent in men and in the physical environment. This individual is not relative to the environment but the environment, *once it allows him the means of shear physical subsistence, is fundamentally relative to him*, to his needs, to his abilities. For while the social sicentist sees patterns of actualized behavior, this man sees patterns of possibilities for himself and others of which the existent set-up is only one form. He is no doubt affected by the present realized possibilities, but while the needs and abilities, or habits, of others are such that *they* see no further, *he* conceives of a world of which the present is merely one possibility. He is a carrier of a transmitted culture, to be sure, but in him there germinates as a result of his own capabilities

[11] p. 4.
[12] p. 5.

in contact with that outlook, new possibilities for himself and for others. He carries the current, but in him it is also being transformed. If he is no social leader, the effects are not great, but if he is, the changes in him are the beginnings of change in the cultural standard.

Accordingly, the importance of the individual's growing abilities and needs as the generators or regenerators of a culture needs explicit theoretical recognition if the transformation of cultural patterns is to be explained. The causal matrix of a social movement is not in social norms but in the dynamic life of the individual who reacts to these norms with satisfaction and dissatisfaction, and who has the necessary understanding and ability to produce the same effects in others.

Thus the attention of the social psychologist must be brought back once more to the nature of the needs and abilities of the individual, the receiver, transmitter, and transformer of norms. The reader of the present work might well suggest that Professor Cantril would grant all of this, but we shall try to show that the stress on the interiorization or introception of social norms does not give adequate recognition to the contribution of the individual. This may be seen as we outline specific aspects of Professor Cantril's theory of motivation.

III. The Pre-Societized Individual

According to Professor Cantril the individual is motivated by "basic needs for food, sex, and shelter." [13] In satisfying these needs he must take account of cultural norms or methods of fulfilling needs. The individual interiorizes these norms sometimes suddenly, sometimes gradually as a result of specific experience, sometimes by "secondhand contact with the values as reflected in the ideas and behavior of other people," [14] and sometimes by other more or less rational means of accepting values. However, a "clear indication that many norms of the culture are uncritically accepted by a large

[13] *Op. cit.*, p.4.
[14] p. 7.

majority of the people" [15] is found in the relative uniformity of a culture. But Professor Cantril also realizes that "the uncritical acceptance of cultural standards is bound to vary with the equilibrium of the culture or the uniformity of the values of the culture." [16]

The difficulty with such a statement is that cultural equilibrium is a meaningless concept unless it is defined more concretely in psychological terms. Are equilibrium and uniformity intelligible psychological concepts unless they be defined in terms of satisfaction of individual needs? If not, our problem is to discover these needs, the inadequate satisfaction of which destroys psychological equilibrium, produces conflict, provokes critical scrutiny of established norms, and initiates or accelerates the development of new standards.

Professor Cantril at this point is guided by the exceptional critique of instinct theory supplied by Professor G. W. Allport in *Personality: A Psychological Interpretation.* The contentions that there has been so little agreement in classifications of instinctual needs, and that any system of fixed needs common to all men is inadequate to explain the individual variations in human behavior and culture, force Professor Cantril 'to find some way to account for this variety of motives without positing a total host of instincts or needs or without trying to classify all specific motives as some permutation of one of a more restricted number of basic drives.' [17]

It must be noted in passing, for we shall not argue the case for instinct-theory as such here,[18] that Professor Cantril explicitly agrees that there *are* some such original energies, for as he says, "we cannot deny that there are certain basic, biological needs, such as those for food, shelter, and sexual gratification, more or less common to all men." But even these are inadequate to explain the complexity and organization of individual and adult motivation. "They become so

[15] *Ibid.*
[16] p. 10.
[17] p. 33.
[18] *Cf.* P. A. Bertocci, A critique of G. W. Allport's theory of motivation, PSYCHOL. REV., 1940, 47, 501–532, and Professor Allport's reply in same issue (533–554).

conditioned or regulated by cultural influences that later on they may be scarcely recognizable." [19]

Professor Cantril is evidently sufficiently convinced that cultural uniformity can be explained on the basis of the introception of social norms which overlay or channelize such elementary needs. Hence he seems not to realize, perhaps, that a longer list of original drives more or less common to all men, is both a better support for such uniformity as there is, and also a better *partial* explanation of the causes of conflict in a given culture. The more common needs we grant men to begin with, the more reason we have to expect uniformity in cultural objectives, *if* the physical and social environment provide the necessary means for development. At the same time, if men have more than the three biological needs, in an unkind environment, the more sources there are for disequilibrium. It seems highly improbable (and I should suggest, psychologically impossible) that three basic needs on this biological level should be the motivational roots of our complex lives. Indeed, if the permutations of a larger list are inadequate to explain specific motives, then the permutations and developments of this list, which is so limited both in quantity and in quality, are all the more inadequate! Professor Cantril himself is forced to appeal to a motive of a different quality, the desire for meaning, as we shall see. The problem, it would seem, is inescapable, much as we might like to avoid its knotty and complicated intricacies. Could social change and equilibrium have an intelligible psychological meaning apart from drives-for-satisfaction (whatever the physiological correlates of these be) we might be able to escape the entanglements of instinct theory.

IV. The Functional Autonomy of Derived Motives

Professor Cantril might reply that the explanatory value of an extended list would be of little explanatory value—hardly worth the trouble, perhaps, of all the investigation involved. For he has stated that "whether or not the real origins of derived drives are ever discovered, there would

[19] p. 32.

seem to be overwhelming evidence from personal experience and observation that men's interests, when once formed, are by no means necessarily sustained by some original urge." [20] Professor Cantril thus accepts the theory of functional autonomy which Professor Allport [21] developed to account for the uniqueness of individual personality. "The wheat farmer, the architect, the carpenter, the concert pianist, the life-insurance salesman, the fisherman, the sea captain, the cook, the devoted mother are all motivated by derived drives" [22] which are no longer functionally connected with earlier urges. "A search for some earlier, more primitive need as the source for the contemporary energy of these drives forces one to indulge in highly imaginative speculation." [23] Having accepted the concept of functional autonomy, Professor Cantril does not follow Professor Allport's particular explanation of the part it plays in personality development.

For the theory of functional autonomy "fails to place the individual and his motives sufficiently in their social context. It obscures the significance of any motive to the whole life of the individual and thereby neglects the intimate relationship between the person, the *me*, the self, and its cultural surroundings." [24] In other words, we cannot explain a man's present striving for money by saying that the desire for money, once connected with his desire to provide for himself and his family, is now functionally autonomous. The question which still needs to be asked is: Why money, especially now that he has much more than he needs? And the answer is to be found in the social context, in the social norm which the individual has accepted and conceives of as a valuable means of improving his status. Earning money, in other words, becomes "a means to some other personal end, some other value which he has incorporated as part of himself." If the money is not a means to social position, then the man would accept a post which improved his social position in his culture even if it

[20] p. 33.
[21] *Op. cit.*
[22] pp. 33, 34.
[23] p. 34.
[24] *Ibid.*

did not increase his bank balance. Thus Professor Cantril concludes:

> Functionally autonomous motives . . . change only when the individual involved can increase his own self-respect or improve his status. *Derived drives are autonomous of their origins but not autonomous of the ego* or of the values in the culture which the individual has somehow interiorized as part of *him*.[25]

Professor Cantril is here suggesting his solution for the problem encountered by any theory of functionally autonomous motives. The consistency of personality structure is hard to explain once drives are granted freedom from their original sources. In our own discussion of Professor Allport's theory, it was suggested that the functional autonomy of motives would be possible from one or several, but not from all, original motives. If motives retain no functional connection with their original roots neither their 'go' nor 'contemporary energy' can be explained, let alone the continuity between motives. Professor Cantril solves the same problem by relinquishing instincts as motives and affirming the (socialized) ego as the ultimate motive and anchor for autonomous drives. It is this crucial concept of the ego (in the development of which Professor Cantril is indebted to M. Sherif) which we must now examine.

V. The Nature of the Ego as an Anchor for Autonomous Motives

The first source for the differentiation of egos.—The empirical data which Professor Cantril sets out to explain are the 'consistency and congruence' of the thought and behavior of the individual. He has argued that these are the result of the acceptance and interiorization of attitudes, frames of reference, and norms. The fundamental fact now to be noted is that "most of these standards, frames and attitudes [are] . . . somehow an integral part of the individual self." [26] Censure and praise an individual's standards and you censure and praise him! Support his standards and attitudes and

[25] pp. 34, 35.
[26] p. 35.

you support him! Attack them and you threaten his existence!

This phenomenon grows out of the dependent individual's realization that his welfare is conditioned by various factors outside himself. Unless he meets the standards of those about him in thought, feeling, and action, *he* is lost. *He* in this case refers not only to his physical welfare but to his social and moral security. "In the process of learning these values or evaluations of the norms surrounding him, the individual acquires them as part of himself. His ego, therefore, becomes enormously extended." [27] Thus, the American believer in democracy feels that he is threatened by a Nazi attack on England. As a general description this account of ego-development cannot be denied.

What factors, however, account for the empirically observed variations between egos? Fundamentally: "Differences in cultural influences, differences in training, differences in temperament and intellectual capacity will all play their role in shaping the ego of every individual." [28] On the surface this account also seems innocent of error.

Nevertheless, before continuing, let us draw several implications from the foregoing description. First, it would seem that the 'ego' as Professor Cantril sees it, is on one side an effect of a culture, and not a cause. Underlying this empirical or phenomenal ego is there not necessarily presupposed, as the receiving agent of cultural influence, another entity or process of activity? Let us call this the *pre-cultured* ego, the *subject*, or *agent-ego*. In these terms, Professor Cantril's 'ego' is the *cultured ego*, as opposed to the *pre-cultured* ego. The former is the joint-product of the *agent-ego*'s inherited cognitive ability, innate needs and temperament, and the physical and social environment with which he interacts. Professor Cantril's 'ego' might also be called the *predicate ego*, since it tells us something about the subject and the world in which that subject-ego is both causal agent and receiver of cultural influence.

[27] p. 36.
[28] p. 37.

A review of the last quotation will show that this distinction between the two egos must be made. The shaping of the ego (effect) is due to the particular nature of receptive and responsive abilities of the individual (temperament, motor equipment, intellectual capacity etc.) as they interact with cultural influences. Curiously enough Professor Cantril does not mention needs among the causes of differentiation among egos, but he does stress differences in abilities, temperament, and training. This is exactly what an instinctivist like McDougall would emphasize to account for variety among individuals who have essentially the same *tendential* energies. We have already noted that Professor Cantril recognizes that (biological) needs are determinative, bargaining agents. But the variability of needs is not emphasized in accounting for the differences in the structure of the cultured ego. This is probably an oversight. Here he is stressing the variability of culture patterns which "contain different established ways of satisfying needs which the individual must uphold if he is to become an acceptable member of the culture." [29]

If one now asks, "What makes cultures different?," he will be told:

> . . . by no means all persons [pre-cultured egos] in the same limited culture will accept to the same extent the characteristic values of the culture. The experience and education of one person [pre-cultured and partly cultured ego] will develop in him a critical ability and perhaps lead him to incorporate as his standards . . . values shared by only a few individuals. . . . Other individuals become dissatisfied with certain values surrounding them but cannot find any consistent, ideal standards with which they may identify themselves.[30]

In other words, the determinants of cultural change in large part are the pre-existent needs in which dissatisfaction roots when cognitive and motor abilities are unable to relieve the tensions that needs set up in a given physical and cultural environment. The cultural pattern of values imposed on the individual's needs and abilities constitute the ways in which others have already satisfied their needs, in accordance with

[29] p. 37.
[30] *Ibid.*

their abilities in their environment. Dissatisfaction occurs when the individual cannot find sufficient satisfaction through these established paths. The point I am stressing for clarity is that every culture, every set of social values, confronts in the pre-cultured self brute facts, potential psychic standards *given* in the individual's agent-self with which that culture must deal if it is to be 'acceptable' to that individual. That the culture imposes brute facts on the individual is true. But that the culture must confront brute facts in the individual's make-up to which it must conform to insure its existence is the rest of the story. The individual seeks harmony in accordance with his conception of the interconnection between his own needs and the demands of others. He is satisfied with a certain mode of living until he is confronted with the fact that other desirable satisfactions which he now conceives to be possible, cannot be his unless he alters the present mode or pattern of existence. Or, he is satisfied with a certain mode of living until he realizes that he cannot be at war with other's standards and still be secure or accepted by them. If he is capable of adequate foresight and intellectual ability, his reaction to the demands of his larger agent-self (perhaps hitherto unknown), and of the larger environment will be of one type; if he has abilities of a different order, his reactions will be modified accordingly.

The point is that the agent-self at any one stage of its history actually selects its ego, according to its conception of its need, ability, and environmental tensions. In the very course of selecting, it chooses not only among the actually established values, but among those *possible to it*, which may have seemed impossible to others, or even passed unnoticed. In other words, the cultured ego may indeed be a response to the demands of that particular part of a culture which the pre-agent self encounters. But we also need to realize that the cultured ego, *other things being equal*, is just as much a product of the pre-cultured self and the challenges that self imposes on the prevailing culture. Especially is this so when the niceties of moral, mental, and spiritual development are in question.

To be sure, other things are not equal, for abilities differ and the innate intensity of needs differs. Thus the social psychologist's hope for a generalization in this area which covers all cases is frustrated. *Some cultured egos* probably are little more than introjected social values—so blunt is the critical ability of the agent-self. Other cultured egos are largely the products of an agent-self which found not only few of the existent values fully adequate, but many decidedly inadequate, and became aware of possibilities for the satisfaction of his own total self as well as those of others. In either case, the nature of the pre-cultured ego gradually selects the ego seemingly adequate to it from among the roughly hewn values mediated to it in the culture. His cultured ego has to fit both his own psycho-physiological *given*, his needs and abilities, as well as those of others. His suit of clothes (cultural values) though custom made, need individual modification if *his* nature is to be comfortable and effective in it.

2. *Other sources for the differentiation of egos.*—Unless these demands and abilities of the pre-societized self are kept in mind there is no explanation for the second source of differentiation between egos. Professor Cantril says: "The differences between the values people incorporate into their egos and the relative differentiation they make ['they' must mean pre-agent selves] between their egos and external objects or social environments will create for individuals differences in their psychological worlds, in the inclusiveness of their life span."[31] There is no doubting the empirical fact so well brought out here, that the ego or values chosen for identification determine, in turn, which stimuli the individual 'sheds' and which he 'welcomes.' What needs to be explained is the fact of differences between values, and the differences in incorporation, but an explanation cannot be found without reference to the abilities and needs the agent-self has to begin with. In a sense, the most important thing about a child and a man is what he excludes, and not what he includes. His resistance can be explained only by going beyond the stimuli

[31] pp. 38, 39.

to the needs and capacities which help determine his choice in the beginning.

Finally, among the variable capacities mentioned specifically by Professor Cantril, as the third and fourth bases for the differentiation of egos, is the ability to understand causality, and the related ability to judge between values as being personally significant. Professor Cantril, again, properly notes that "the core of one person's ego may be composed of certain values which are to another person [exposed to the same values in the same culture] of relatively little importance," [32] and he concludes:

> The egos of some people will closely fit the values of the immediate environment, others will range far and wide in both time and space; some will include many objects of the external world, others will be completely independent of material things; some will be tied to creeds and symbols, others will be indifferent to any ideology; some will cause sacrifice and suffering for objectives that others would lightly dismiss.[33]

There is no explanation as to *why* any individual identifies himself apart from a better description of innate needs. For these become pivots within a given individual around which the intellect must bargain as it faces the world of already existent values.

VI. The Anchorage of Egos vs. the Ego as Anchor

We now arrive at the crucial point. What has happened to the anchorage of motives which according to Cantril, were to be considered autonomous of original needs, "*but not autonomous of the ego* or of the values in the culture which the individual has somehow interiorized as part of *him*"? [34] If our analysis is correct and the ego is itself a joint-product of the pre-societized self and influential social values, if indeed the ego itself is a *derived motivational pattern of values*, or another name for the consolidation of individual-social interactions, the general problem of anchorage for this ego

[32] p. 40.
[33] pp. 40, 41.
[34] p. 35.

must be solved over and above the specific problem of the ego being the anchor for derived motives. If the ego is in part a product of interiorization, then its anchor is the interiorizing agent, or what we have called the agent-self, with its abilities, needs, and temperament. The agent-self interiorizes or accepts, critically or uncritically (depending on its ability), already established values, *because* it has certain needs-to-satisfy, in the best manner possible, in the given environmental situation. The ego which the agent-self develops as the standard for its own activity in a given social situation is the best means, presumably, of satisfying its needs and abilities in that environment. *It no doubt also functions as an internal frame of reference for the further satisfaction of needs and abilities.* Though it is not the home base, it still is an anchorage for further derived needs instrumental to its satisfaction. It itself, however, is the pattern of motives acquired by the agent-self, as an available mode of satisfaction for underlying needs and abilities intrinsic to the self. But once acquired the cultured ego acts to restrain the expression of some original and acquired tendencies and to accelerate the expression of others whose further development is *deemed* consistent with that ego, or indifferent to the values it represents.

To repeat, the notion of cultured ego, or accepted standard of values in which the individual finds his security and his challenge, is inescapable, it seems to me, as an explanatory basis for the actual strivings of men in everyday life. But being itself a product of more basic motivation as developed and modified according to abilities in a given situation, it is itself in need of an explanation which is not forthcoming in words like *interiorization* or *introception* or *identification.* These words give the mystery a name rather than explaining it. This explanation is forthcoming, however, once we give *theoretical* recognition to the existence of an underlying complex of psycho-physiological activities. From this unified complex, we now abstract in order to emphasize the needs and abilities, which endure, with some growth and develop-

ment, *through* the processes of interaction and help to produce a particular cultured ego.

It is our contention, then, that underlying needs, physiological and psychical, play a large part as selective agents, along with abilities, in the development of adjustments to an environment which, in its turn, has a selective effect on individual needs and abilities. Even if, as Professors Allport and Cantril believe, the classification of needs is not only difficult but probably fruitless, or if, after we arrive at a given list, we need then to realize that they do not stand unmodified but enter into every modifying and developmental activity of the total agent-self, we still cannot get along without *some* conception of them if we are to anchor the kind of consistency and continuity we find in the human personality. This consistency and continuity between adjustments is not, to be sure, explicable *only* in terms of such needs and a certain constancy in abilities, for the continuity and consistency is, as Cantril and Allport so well point out, one which is peculiar to the individual, and in many cases to the culture. The original bases for continuity and consistency take on the forms possible to them within a given (incompletely explored) physical and social environment. The ego is the *acquired* focus for consistency and bears witness to both the inner needs and abilities and the requisitions implicit in an environment.

3. *The relation of the ego, self-regard, and the agent-self.*— This discussions of the relation of the cultured ego to the self takes on added significance as we study the next step in Professor Cantril's analysis of the ego. According to him, the 'subjective counterpart' of the ego is the feeling of self-respect or self-regard, in relation to which the individual "evaluates the felt significance of any action." [35] Professor Cantril is careful to dissociate himself immediately from McDougall's conception of the sentiment of self-regard which is so largely rooted in the motivating propensities of self-assertion and submission. For him, on the other hand: "The feeling of self-regard, like the ego, is composed of the values and standards of judgment an

[35] p. 41.

individual interiorizes as part of himself." [36] The feeling of self-regard is the subjective product of the agent self's evaluation of his own ego. Self-respect is not founded "on hypothetical propensities which extend themselves during the course of life," as McDougall might say, but on "ascertainable values with which the individual identifies himself." [37]

What has happened here? The feeling of self-regard has been tied to the ego. The ego in turn has been tied to social values "with which the individual identifies himself." But why does the individual identify himself with any one set of values? An adequate answer is not forthcoming. To extricate self-regard from urges as modified by the ability and environment (on McDougall's view) and append it to an ego which is inexplicable apart from some underlying needs it satisfies in a given social context is to complicate rather than clarify the relation of self-regard to the *self*. When the knower (agent self) 'introspects' his ego, what other basis does he have for judging it than what he knows about himself and about the values he has related to himself? The cultured *ego* produces a high *regard for self* if that ego is consistent with the best the individual knows for his needs and abilities. But if that ego is not consistent with what the individual thinks he can do, or with other needs of his nature, or with the demands of *his* social group, then there is a different regard for self. In other words the degree of self-regard is an index *also* of the relation which cultured ego bears to the more remote, unrealized aims of the individual for a still better satisfaction of needs and abilities.

An individual's *status* is a reflection of the esteem placed upon him by other individual and is indeed, as Professor Cantril states, "relative to the particular norms found in a culture at any given time." [38] Here the individual is likely to be evaluated according to the nature and the achievements of others only. But any particular feeling of self-regard is a response which any cultured ego, or aspect of that ego, calls forth in the agent-

[36] pp. 41, 42.
[37] p. 42.
[38] p. 43.

self which sees his cultured ego as a station at which its abilities and needs can tarry on their way to more complete functioning. Any particular cultured ego is thus always to be evaluated in relation to the underlying abilities of the agent *and* in relation to prevailing norms. Once the individual has an ego he deems suitable to his whole nature and situation, the drive to sustain and maintain it against further developments is obviously tremendous, for it represents his stake in the world.

That Professor Cantril is not unaware of the part which other factors besides culture play in the development of the ego comes out again quite clearly in his discussion of 'self-integrity.' "However, a person's ego and, consequently, the way in which he regards himself are by no means always *entirely* bound by the surrounding culture." [39] Many people 'by nature, by training, or by a combination of both,' are not able or willing to accept established goals without compromise. They consequently "identify themselves with goals not yet achieved, . . . not yet approved by the majority. Their self-regard is determined by standards from a small minority group, from reading, from discussion, or from their own creative intellectual activity." [40] As a consequence, they develop, in addition to these accepted from others, values which they cherish as their own all the more because they are not generally approved. Unless they are true to these values, they cannot maintain their self-regard which comes through self-integrity.

Here, as we see, the 'inner self' (my 'agent-self') is seen as active in the development of modes of behavior which satisfy what it takes to be its own nature. In other words, the very being of a self *for itself* creates demands for the environment to satisfy at pain of being disregarded, as well as creating problems for the social group to deal with as it tries to induce conformity in the recalcitrant nature of this peculiar member. But self-integrity is a cover-word whose meaning depends completely on the nature of the self to which one is supposed to

[39] p. 44.
[40] pp. 44, 45.

be true. As a matter of fact would it not be better to define the term psychologically in such a way that it could be used for all individuals who sincerely prosecute the ego which seems to them best even when the norms composing that ego are completely accepted from others? The concept of self-integrity forces us to consider the *quality* of the ego. Quality in turn, must be understood in relation to the struggle which the individual's original needs and abilities have with the world. Here, then, is another concept which is unintelligible without reference to original needs and abilities.

Our difficulty, we must emphasize, is not with Professor Cantril's insistence that motivation cannot be put in its proper social context except by understanding the development of the ego. That is a true assertion and admirably clarified. Doubts are raised when we are told that "only by understanding the relation of needs, derived drives, frames of reference, and attitudes to the ego can motivation be placed in its proper *personal* context." [41] For, if 'personal context' is equated with ego, it then really means 'social context interiorized with some modification in some cases.' In other words the personal context is fundamentally the social context! If we want a truly personal context we must relate our socialized ego to the personal needs and abilities of the agent-self. The ego-drive which is the central motivating dynamo in Professor Cantril's motivational system is in fact a derived drive. This study might well close with further confirmation of this thesis.

In Professor Cantril's words: "Our own introspection and our observation of the behavior of other people indicate that *an individual is constantly trying to maintain or enhance his own feeling of self-regard.* . . . For, the individual whose ego is composed so largely of interiorized values must maintain respect for these values if he is to remain himself or if he is not to become a disintegrated, abnormal personality." [42] Does not this statement imply that the basic drive underlying the ego is the drive for self-respect, for personal wholeness? If,

[41] pp. 45, 46.
[42] p. 46.

as Professor Cantril says, "the values [of the ego] are not maintained, the individual has neither respect for himself nor the respect of others." [43] Professor Cantril here, it seems to me, is on the threshold of a concept which his own psychology and much other modern psychology seems to require. Why 'must' an individual maintain respect, or flee disintegration? Some prior, more ultimate drive is implied here. One fact seems inescapable in connection with Professor Cantril's ego-drive. The particular ego-drive of any individual, the particular ego he desires to enhance is itself not a psychological ultimate but a means-to-satisfaction of drives given in the very nature of the agent-self or individual.

As we have already said, this ego-drive becomes itself a bridgehead between the original nature of the individual's urges and abilities, and the surrounding environment. The agent-self wills to maintain his present ego frequently because nothing better is available, or the better is too far beyond reach —and for other reasons Professor Cantril describes so well.[44] The point is that whatever drive it has comes not from the environment, and not from itself, but from the underlying drives, whatever they are, which were forced to accept this particular modification of their energy-output and ultimate *general* direction. If the will-to-live were not itself a hopeless abstraction which needed further definition in terms of the goals *implicit in living*, the ego might be seen as the half-way house at which the will-to-live comes to rest in its struggle for survival in a given culture. As it is, it seems better to confine oneself to the best description of the more specific universal tendencies. These *tendencies* would provide adequate anchorage for the ego since it will then be explained as the product of their modification or expression in a given environment in accordance with available abilities.

Finally, Professor Cantril himself introduces an underlying 'desire for meaning' to help account for the individual's pursuit of meaning when he is faced by a problematic situation with which he is dissatisfied. The individual is "tense until

[43] *Ibid.*
[44] *Cf.* pp. 46 ff.

his understanding is more complete, until he can make sense out of the problem. . . ." [45] But Professor Cantril's own psychological frame of reference is revealed in the following almost embarassed explanation. "Although the postulation of a highly derived, intellectualistic desire for meaning may seem to go against the rules of scientific parsimony, and although its physiological bases may be completely unknown, still few people can deny that subjectively it is a desire that occasionally *is* most poignantly felt." [46] What is this desire for meaning, this desire to see connections,[47] but the propensity for curiosity? Why should an intellectual desire be derived, anyway, unless the frame of explanation and causality is restricted to the physiological (contrary to the professed functional frame of reference)? If we stay on the functional and phenomenal level it would seem that the kinds and varieties of meanings an individual can experience are related to the number and *quality* of his original demands. Hence, it may well be that the pursuit of meaning in psychology will lead us not only to an innate need-to-interpret (curiosity), but to investigate other less physiological or non-physiological sources of conflict.

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[45] p. 59.
[46] *Ibid.*
[47] *Cf.* p. 60.

A NOTE ON DR. CARTWRIGHT'S ARTICLE ON DECISION-TIME

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In an interesting article entitled 'Decision-Time in Relation to the Differentiation of the Phenomenal Field' [1] Dr. Cartwright presents a general theory which posits a relation between the duration of decision-time and the resultant of the forces in the field which act upon the individual. The relatively long judgment-times which occur in difficult perceptual comparisons are explained by conflicts between approximately equal 'valences' of the topological 'regions' which correspond to the existing alternatives, or, more generally, to the different categories of response. The velocity "depends upon the magnitude of the resultant . . ., . . . as the conflicting forces become more equal, locomotion is increasingly retarded until the forces become balanced and it stops completely." [2] Consequently any decision would be suspended in cases of equilibrium. Dr. Cartwright, however, admits another factor which influences the velocity of the judgment. "Some change in the situation," he says, "brings about an imbalance of the forces. Since time will be consumed before this imbalance occurs, the decision-time will necessarily be *lengthened* (italics mine) when there is an initial equivalence of the opposing forces." [3]

Here, apparently, there is some inconsistency. Although Dr. Cartwright may be right in that the production of an imbalance requires time, this time is hardly relative to the magnitude of the field-forces. Moreover, the corresponding change in the organization, if it is produced, signifies no re-

[1] D. Cartwright, Decision-time in relation to the differentiation of the phenomenal field, PSYCHOL. REV., 1941, 48, 425–442.

[2] *Ibid.*, 427.

[3] *Ibid.*, 427–428.

tardation, but rather an *acceleration* of the decision-process, which otherwise would be infinitely delayed. In order to uphold the vital point of the theory one would have to assume that the velocity of the locomotion depends *in any given moment* upon the then-existing resultant force. As soon as the organization of the field changes, there may appear a finite resultant force instead of the former equilibrium, and consequently a judgment may be reached in the corresponding time. At any rate it will be difficult to prove this hypothesis as long as one cannot measure exactly the partial times of the different phases of the complex process. A prolonged judgment-time, in so far as it concerns the whole time between the processes of comparison and of decision, may therefore be said to be a *sign* of a (conscious) conflict rather than a *measure* of it.

Yet it seems questionable whether the theory is wholly accurate even with the above interpretation. It might be that the length of decision-time keeps practically constant as long as the conflicting forces of the field are sufficiently different. To be sure, a certain minimum will always be necessary. Now let us consider the case of a conscious conflict where the opposing forces are approximately equal. Then there will arise new factors which aim at a sensitive imbalance because the subject wishes to come to a decision. Which are the factors capable of destroying the equilibrium? Cartwright suggests the following factors: (1) A process of comparison and consideration by which the alternatives are viewed 'in a more detailed way or in a different light.' (2) "Tentative choices. When the person sees himself as having selected one alternative, the other appears more appealing and he tentatively selects it." This process may continue "until a 'final decision' is enforced by the situation." (3) "Certain situations compel choices within a given interval of time." They may also operate to reduce the 'amount of imbalance required for locomotion.'[4] (4) The tension which the opposing forces produce in the subject operate in the same way.

[4] *Ibid.*, 428.

It is difficult to see how the first and second of these factors agree with the general character of Dr. Cartwright's dynamic field theory. Comparison and consideration as well as tentative choices must be interpreted as processes of differentiation and articulation which depend upon the forces of the *field*. There may be cases, however, of complete subjective equality in spite of high differentiation. How will the necessary imbalance then be brought about? The same might be said with reference to the third and fourth points. Indeed some of the present writer's experiments show that the subject, in spite of his efforts, sometimes cannot come to a decision. He feels himself alternately pushed or pulled, now to one side and then to the other.

Years ago I described and analyzed such processes in my book *Urteil und Beurteilung*.[5] The subjects, who were instructed to classify figures composed of points in such a way that they gradually approached straight lines, often could not come to a decision, but inclined now to one and then to another judgment. *Periodic fluctuations* resulted; the psychic system began to *oscillate*. And this fact seems noteworthy, for such states could hardly happen if there were no momentary changes of the existent field-forces. Yet the momentary imbalance is obviously not always sufficient to bring about a judgment in spite of the desire of the person who strives to put an end to the disagreeable task. Apparently the lack of equilibrium must last a certain minimum of time or the imbalance must pass a certain degree of magnitude in order to be effectual. Finally, the subjects, after much delay, felt that the judgment was being 'extorted'; on certain occasions they decided *against their conviction* under the social pressure of the experimenter's presence. It was no real 'judgment' and did not satisfy the subjects.

Sometimes these doubts continued even after the verbal decision was made. They caused occasional falsification of the memory of the given judgment and gave rise to scruples about its exactitude and to corrections. Possibly the de-

[5] W. Blumenfeld, Urteil und Beurteilung, *Arch. f. d. ges. Psychol.*, Erg. Bd. III' Leipzig, 1931, pp. 189–192, 484–488.

cision-time of intermediate judgments may have been influenced by such reflections and doubts.

I have tried to measure roughly the time of the oscillation period with a few subjects; it ranged between approximately 3 and 7 seconds. Perhaps it might be useful to continue these investigations in order to learn if the time of the oscillation depends essentially upon the material of the comparisons in the special task, or upon the number of 'regions,' or if there exists a personal constant (analogous to the physical law of small pendulum oscillations). Possibly many factors must be considered. Attention might be called to W. Köhler's observation of similar oscillations in hens forced to choose between colors.

Long continued oscillations are likely to occur with greater frequency in cases of indissoluble conflicts than when a 'central category' of judgment is admitted, for this category, be it desirable or not to use it, presents to the subject an outlet in cases of balance with their corresponding disagreeable states of oscillation. To be sure, the subject will be more inclined to choose this loophole if the category of equality is accepted "upon a par with the categories of difference" [6] as Cartwright says, than if he is instructed not to give that judgment unless absolutely necessary. One might agree to the existence of a central category. One would be less inclined, however, to agree with his conclusion that the average judgment-time will be the longer "the greater the number of categories which are applied to a given range of stimuli" [7] since cases of complete balance can occur more easily when there exist only two categories (as we attempted to explain). Furthermore it is questionable whether the *average* judgment-time has the importance which Cartwright attaches to it.

The foregoing considerations suggest the following statements in partial accord with the theory proposed by Cartwright. The duration of the decision-time depends upon the 'momentary' resultant of conflicting forces, it being admitted that a certain maximum of speed cannot be passed, and it

[6] *Op. cit.*, 438.
[7] *Ibid.*, 441.

being understood that the word 'momentary' denotes integration over not too small intervals (3 to 7 seconds or more). In cases of difficult differentiation of the structure of the field a judgment requires the time corresponding to the small resultant force. In situations of complete balance of the field-forces the decision-time would be infinitely prolonged and the individual would be subject to the characteristic oscillations of painful doubt. If a decision is enforced and the judgment of indecision or equality is not allowed, the individual may 'leave his decision to chance,' utilizing a 'favorable' moment of imbalance during one of the oscillations in more or less good faith. Or the subject, contrary to the dictates of his conscience, arbitrarily selects an alternative. In such cases he may quiet or beguile his conscience by the reflection that each decision is equally right and wrong. Yet obviously the measure of the time consumed in the process has no symptomatic value unless it happens to be *relatively* long; and as certain experiences seem to prove, the processes which occur in cases of imbalance may even effect succeeding comparisons.

In my previously mentioned publication it was shown that attitudes of severity or mildness imposed on the subject generally effected an essential, although not indefinite, change in the quality of the judgment. It should be useful to compare the judgment-times in such cases with those under 'normal' conditions and to widen the frame of the theory so that it also includes these more complex cases.

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PSYCHOLOGICAL FORCES IN THE DETERMINATION OF DECISION-TIME AND DR. BLUMENFELD'S CRITICISM

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In the midst of world-wide war it is gratifying to realize that, to some extent at least, psychologists are still able to exchange views upon an international scale. Since science prospers only through free and unrestricted communication of information and theories, I am especially pleased to have the opportunity to reply to Dr. Blumenfeld's note discussing my recent paper on decision-time (1).

Three particularly cogent points have been raised which deserve careful consideration: (*a*) Can decision-time be taken as a *measure* or must it be employed only as a *sign* of conflict. (*b*) As the theory was stated, a decision should be made whenever any imbalance of forces exists, but oscillations which occur under certain circumstances before a decision is reached seem to indicate that imbalances do not always produce decisions. (*c*) The theory clearly demonstrates the need for a better analysis of those factors producing the imbalance of forces which bring about a decision.

The first point raises the question of measurement in psychology, a question entailing many knotty problems which cannot be treated adequately here. The most primitive requirement for measuring an entity like conflict, however, is to be able to express the notion of conflict in conceptual terms which permit quantification. This requirement was of paramount importance in selecting the concept of psychological force as basic to the theory of decision-time and conflict. By defining conflict as opposition of forces, a step was made toward its measurement, since psychological force, theoretically at least, is susceptible to quantification.[1]

[1] The conceptual properties of psychological force are: magnitude, direction, and point of application.

The next fundamental requirement for measuring conflict lies in finding an observable symptom of the presence of opposing forces which is itself measurable. In other words, the operational definition of conflict must be made in terms of operations which are susceptible to quantitative measurement. It is essential, and this point needs explicit recognition, that the conceptual definition (in this case, opposition of forces) and the operational definition be viewed as intrinsically related. On the basis of the theory of opposing forces, it appears that decision-time, measured in physical units, should be lengthened as opposing forces become more and more equal in magnitude. If the theory works, as it seems to do,[2] the operational definition of conflict as lengthened decision-time may be considered a good one.[3]

The final step in measuring conflict involves the establishment of a precise relation between variations in the relative magnitudes of the opposing forces, on the one hand, and variations in decision-time, on the other. Until the final step can be made, it would be incorrect to assume that a satisfactory measure of conflict has been attained. Dr. Blumenfeld is certainly correct in maintaining that this last step has not been taken.

It is interesting in this connection, however, to examine what possibilities of progress seem to be available. I have already indicated the direction in which the theory is looking. It is my belief that the final requirement outlined above will be met in the relatively near future. By stating that *maximal* judgment-time is associated with equality of opposing forces, rough limits have been set up within which further quantification can later be made. Recently, in collaboration with Mr. Festinger (3) considerable progress has been achieved in determining the precise relation of decision-time to forces by use of probability theory in estimating the fluctuation of

[2] For a detailed discussion of the empirical tests of the theory, see Cartwright (2).

[3] It should be clear that decision-time is only one of several possible symptoms of conflict. Emotional disturbances, for example, are closely related to conflict; but up to the present no objective measurements have been successfully established which permit scaling of intensity.

forces in time and by further experimentation. We hope shortly to publish the results of this further study.

Dr. Blumenfeld's second criticism is that the theory of decision-time, as proposed, does not adequately allow for oscillations of judgment (such as 'vicarious trial and error'). In stating the theory, I had in mind the rather primitive concept of threshold to account for such oscillations. It was assumed that the imbalance of forces must exceed a certain threshold value before a 'final' decision can be reached. Fluctuations which do not exceed this value give rise to the sort of oscillations to which Dr. Blumenfeld refers. While, on the surface, this statement of the theory does account for the phenomena under discussion, the notion of threshold is not conceptually very clear and is certainly not coordinate to the concept of force.

To make the theory more strictly self-consistent and to sharpen the empirical predictions in a quantitative way, a dynamic concept may be substituted for that of threshold. If, in the life space of an individual, a force acts upon a person and no change of position occurs, an opposite force of equal magnitude must, by definition, also be present. In our case, when the attractiveness of one alternative slightly exceeds that of the other and still no 'final' decision is reached, we may assume that a restraining force [4] is keeping the person in the region of 'indecision.' The magnitude of this restraining force determines the magnitude of the resultant driving force required to produce a decision. While a variety of conditions will affect the magnitude of the restraining force, such personal attributes as caution and conservatism in making judgments will be expressed conceptually in terms of restraining forces.

The use of the concept of restraining force not only accounts for observable oscillations prior to a 'final' decision, but it also directly affects the predicted length of decision-time. We have seen above that the magnitude of the minimal resultant driving force which will give rise to a decision is determined by the magnitude of the restraining force opposite

[4] The concept of restraining force has been carefully developed by Lewin (4). Particular reference should be made to pp. 123–127.

to it. The greater the restraining force the greater will be the resultant force required to overcome it. Since slight fluctuations in the driving forces are more probable than large ones, we should expect, if the fluctuations assume a chance distribution, to get a decision more quickly the smaller the magnitude of the restraining forces. The precise relationships to be expected between restraining forces, driving forces, and decision-time have recently been determined (3).

To Dr. Blumenfeld's third point I should like to add my own assent. The theory, as it has been developed, starts by assuming that psychological forces fluctuate in a given way in time, but no attempt has been made to analyze in detail the factors which produce this fluctuation. Certain classes of phenomena were enumerated which seem to deserve especial attention if such an analysis is to be made. Psychology can progress only by a proper balance of observation and conceptualization. At certain stages of development it appears more fruitful to restrict the range of data to which a theory is to apply. Once the theory is conceptually clear, however, the restrictions should be removed and the theory should be tested by its ability to handle larger spheres of phenomena. It seems to me that the time has now come to apply a richer set of phenomena to the theory of decision-time. Dr. Blumenfeld's examples raise many interesting problems and, together with other material gained from further phenomenological analysis of decisions, they indicate a program for further investigation within this field.

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Journal of Genetic Psychology—Provincetown, Mass.; The Journal Press. Subscription $14.00 per annum (2 volumes). 1000 pages annually. Edited by Carl Murchison. Quarterly. Child behavior, animal behavior, and comparative psychology. Founded 1891.

Psychological Review—Northwestern University, Evanston, Illinois; American Psychological Association, Inc. Subscription $5.50. 540 pages annually. Edited by Herbert S. Langfeld. Bi-monthly. General psychology. Founded 1894.

Psychological Monographs—Northwestern University, Evanston, Illinois; American Psychological Association, Inc. Subscription $6.00 per volume. 500 pages. Edited by John F. Dashiell. Without fixed dates, each issue one or more researches. Founded 1895.

Psychological Bulletin—Northwestern University, Evanston, Illinois; American Psychological Association, Inc. Subscription $7.00. 665 pages annually. Edited by John A. McGeoch. Monthly (10 numbers). Psychological literature. Founded 1904.

Archives of Psychology—New York, N. Y.; Columbia University. Subscription $6.00 per volume. 500 pages. Edited by R. S. Woodworth. Without fixed dates, each number a single experimental study. Founded 1906.

Journal of Abnormal and Social Psychology—Northwestern University, Evanston, Illinois; American Psychological Association, Inc. Subscription $5.00. 560 pages annually. Edited by Gordon W. Allport. Quarterly. Founded 1906.

Journal of Educational Psychology—Baltimore, Md.; Warwick & York. Subscription $6.00. 720 pages annually. Edited by J. W. Dunlap, P. M. Symonds, and H. E. Jones. Monthly except June to August. Founded 1910.

Psychoanalytic Review—New York, N. Y.; 64 West 56th St. Subscription $6.00. 500 pages annually. Edited by Smith Ely Jelliffe. Quarterly. Founded 1913.

Journal of Experimental Psychology—Northwestern University, Evanston, Illinois; American Psychological Association, Inc. Subscription $14.00 per annum (2 volumes). 1040 pages annually. Edited by Samuel W. Fernberger. Monthly. Founded 1916.

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Journal of Comparative Psychology—Baltimore, Md.; Williams & Wilkins Co. Subscription $14.00 per annum (2 volumes). 1000 pages annually. Edited by Roy M. Dorcus, Knight Dunlap and Robert M. Yerkes. Bi-monthly. Founded 1921.

Comparative Psychology Monographs—Baltimore, Md.; Williams & Wilkins Co. Subscription $6.00 per volume. 400 pages. Edited by Roy M. Dorcus. Without fixed dates, each number a single research. Founded 1922.

Genetic Psychology Monographs—Provincetown, Mass.; The Journal Press. Subscription $7.00. 500 pages annually. Edited by Carl Murchison. Bi-monthly. Each number one complete research. Child behavior, animal behavior, and comparative psychology. Founded 1925.

Psychological Abstracts—Northwestern University, Evanston, Illinois; American Psychological Association, Inc. Subscription $7.00. 700 pages annually. Edited by Walter S. Hunter and H. L. Ansbacher. Monthly. Abstracts of psychological literature. Founded 1927.

Journal of General Psychology—Provincetown, Mass.; The Journal Press. Subscription $14.00 per annum (2 volumes). 1000 pages annually. Edited by Carl Murchison. Quarterly. Experimental, theoretical, clinical, and historical psychology. Founded 1927.

Journal of Social Psychology—Provincetown, Mass.; The Journal Press. Subscription $7.00. 500 pages annually. Edited by John Dewey and Carl Murchison. Quarterly. Political, racial, and differential psychology. Founded 1929.

Psychoanalytic Quarterly—Albany, N. Y.; 372–374 Broadway. Subscription $6.00. 560 pages annually. Edited by Bertram D. Lewin and others. Quarterly. Founded 1932.

Character and Personality—Durham, N. C.; Duke University Press. Subscription $4.00. 360 pages annually. Edited by Karl Zener. Quarterly. Founded 1932.

Journal of Psychology—Provincetown, Mass.; The Journal Press. Subscription $14.00 per annum (2 volumes). 800–1200 pages annually. Edited by Carl Murchison. Quarterly. Founded 1936.

Psychometrika—University of Chicago, Chicago, Ill.; Psychometric Society. Subscription $10.00. 320 pages annually. Edited by L. L. Thurstone and others. Quarterly. Quantitative methods in psychology. Founded 1936.

Psychological Record—Bloomington, Ind.; Principia Press. Subscription $4.00. 500 pages annually. Edited by J. R. Kantor and C. M. Louttit. Without fixed dates, each number a single research. General psychology. Founded 1937.

Journal of Consulting Psychology—Lancaster, Penn.; Science Printing Co. Subscription $3.00. 240 pages annually. Edited by J. P. Symonds. Bi-monthly. Founded 1937.